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# MYSIDACEA FROM THE CENTRAL AND WESTERN PACIFIC

## I. GENUS *PSEUDOMMA* (TRIBE ERYTHROPINI)

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*With Text-figures 1-26*

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In Ocean Research Institute, University of Tokyo, there are collections of Mysidacea being composed of over 120 species including a number of new and rare species. These collections were mostly obtained by two methods, using a large-sized conical plankton net with its mouth diameter of 160 cm (ORI-net) and a net with a runner in its lower part (bottom-net). I have the intention of publishing in series the reports on the taxonomy and distribution of these mysids.

As the first paper, 18 species belonging to genus *Pseudomma*, 11 of which proved to be new, are discussed. Since genus *Pseudomma* was established in 1870 by G. O. Sars, 24 species have been known throughout the world oceans and seas. (Recently *Pseudomma oculospinum* W. Tattersall was transferred to *Scolamblyops* by Murano.) Five species already known, *P. calloplura*, *P. multispina*, *P. matsuei*, *P. izuensis* and *P. japonicum*, from the adjacent seas of Japan are represented as parts of the present collections. However, *P. sp.* which was reported in 1964 by Ii from Sagami Bay has the peculiarly hispidulous character of the integument of the appendages and still remains an indefinite species.

Generally, the genus *Pseudomma* seems to live on or close to the sea-floor, but not in the mid-layers of the sea, so that 14 species were caught by the bottom-net, 3 by the plankton net attached to the mouth of a beam trawl, 3 by the ORI-net which accidentally touched the sea-floor, and 2 from the stomachs of benthic fishes. (Among these, 4 species were taken by two methods.) The sampling date, time, position and depth are listed in appendix-tables. The type specimens in the collections are stored in Ocean Research Institute, University of Tokyo.

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Order MYSIDACEA  
Suborder MYSIDA  
Family MYSIDAE  
Tribe ERYTHROPINI  
Genus *Pseudomma*

*Characteristics of the Genus*

1. Eye reduced to a single, broad and flattened plate which is united in the median line.
2. No visual elements or pigment present.
3. Eyeplate with a well-marked cleft at centre of anterior margin.
4. Antero-lateral margin of this plate either serrated or unarmed, and not furnished with a prominent spinous process.
5. Anterior margin of carapace evenly rounded.
6. Telson linguiform or trapezium and furnished with 1 or several pairs of strong spines on its distal margin.
7. In living specimens the body and appendages more or less wine red or reddish purple.

*Remarks*

Now, genus *Pseudomma* comprises so large a number of distinct species as 35 by the addition of 11 new species in the present collection, and is the largest genus in the Erythropini.

These species may be classified in 8 groups from the characters of eyeplate, telson and others as follows. However, an Australian species, *P. australe*, is excluded from the present grouping because the feature of the telson still remains uncertain.

*Matsuei*-Group

Eyeplate without serrated margin.

Telson with naked lateral margin.

*P. matsuei* Murano

*P. surugae* sp. nov.

*P. intermedium* sp. nov.

*Minutum*-Group

Telson small and triangular in shape.

*P. minutum* O. Tattersall

*P. omoi* Holmquist

*Belgicae*-Group

Eyeplate without serrated margin.

Telson with small spines on lateral margin.

*P. kruppi* W. Tattersall

*P. longisquamosum* sp. nov.

*P. calmani* O. Tattersall

*P. brevisquamosum* sp. nov.

*P. armatum* Hansen

*P. belgicae* Holt and W. Tattersall

*Nanum*-Group

Eyeplate with serrated margin.

Telson with naked lateral margin.

*P. bispinicaudum* sp. nov.

*P. antarcticum* Zimmer

*P. nanum* Holt and W. Tattersall

*P. marumoi* sp. nov.

*Calloplura*-Group

Endopod of fourth pleopod of male longer than exopod and with a single extremely long non-plumose seta on its penultimate segment.

Spines on distal margin of telson with minute spinules on each side.

Apical plumose setae absent on telson.

*P. calloplura* Holt and W. Tattersall

Most peculiar group in the genus is this, and is made up of only a single species at the present time.

*Longicaudum*-Group

Telson long and armed on its lateral margins with many spines arranged with larger spines in the spaces between smaller spines.

*P. longicaudum* O. Tattersall

*P. lamellicaudum* sp. nov.

*Schollaertensis*-Group

Telson long, armed on its distal margin with spines which become progressively longer from inner pair to outer pair.

*P. schollaertensis* O. Tattersall

*P. multispina* Birstein and Tchindonova

*Affine*-Group

Eyeplate with serrulation.

Telson with 3 or 4 pairs of long spines on distal margin and with 3 to 6 small spines on each lateral margin.

*P. latiphthalmum* sp. nov.

*P. magellanensis* O. Tattersall

*P. berkeleyi* W. Tattersall

*P. crassidentatum* sp. nov.

*P. sarsi* G. O. Sars

*P. okiyamai* sp. nov.

*P. tanseii* sp. nov.

*P. izuensis* Murano

*P. truncatum* Smith

*P. japonicum* Murano

*P. chattoni* Bacesco

*P. affine* G. O. Sars

*P. frigidum* Hansen

*P. roseum* G. O. Sars

This group is of the most typical feature in the genus. In the group 2 species, *P. magellanensis* and *P. okiyamai*, constitute a subgroup in the characteristics of the male pleopods of which the exopod is much longer than endopod.

## Key for the identification of the species in the genus

1. Eyeplate without serrated margin. .... 2
- Eyeplate with serrated margin. .... 13
2. Spine terminating naked outer margin of scale situated close to base of scale. ....  
..... *P. australe* G. O. Sars

- (Bass Str., Australia)
- Spine terminating naked outer margin of scale situated on distal half of scale. .... 3
  - 3. Telson without lateral spines. ....(Matsuei-Group) 4
  - Telson with lateral spines. .... 6
  - 4. Telson with 2 pairs of spines on distal margin. ....*P. matsuei* Murano  
(Japan)
  - Telson with 3 or 4 pairs of spines on distal margin. .... 5
  - 5. Telson 1 and 1/4 times as long as broad at base.....*P. surugae* sp. nov.  
(Japan)
  - Telson 1 and 1/2 times as long as broad at base.....*P. intermedium* sp. nov.  
(Japan)
  - 6. Telson triangular, as long as broad at base; apex with a pair of long spines. ....  
.....(Minutum- Group) 7
  - Telson linguiform or truncate, more than 1 and 1/4 times as long as broad at base. ....  
.....(Belgicae- Group) 8
  - 7. Scale about 4 times as long as broad; telson with 2 denticles or spines on lateral margin...  
.....*P. minutum* O. Tattersall  
(Southern part of South America)
  - Scale about 3 times as long as broad; telson with 1 denticle or spine on lateral margin. ...  
.....*P. omoi* Holmquist  
(Chile)
  - 8. Scale short, not extending beyond antennular peduncle. ....*P. kruppi* W. Tattersall  
(Mediterranean Sea)
  - Scale long, extending beyond antennular peduncle by distal 1/3 to 1/2. .... 9
  - 9. Scale 4.5 times as long as broad; lateral margin of telson with 11 to 13 short spines on  
distal half.....*P. longisquamosum* sp. nov.  
(Japan)
  - Scale less than 3.5 times as long as broad; lateral margin of telson with less than 10 short  
spines. ....10
  - 10. Body smaller than 10 mm. ....11
  - Body larger than 15 mm. ....12
  - 11. Scale 3.5 times as long as broad, extending beyond antennular peduncle by distal half;  
telson 1.5 times as long as broad, with broadly rounded apex.....*P. calmani* O. Tattersall  
(Southern part of South America)
  - Scale slightly shorter than 3 times as long as broad, extending beyond antennular peduncle  
by distal 1/3; telson 1 and 2/3 times as long as broad, with rather truncate distal margin.  
..... *P. brevisquamosum* sp. nov.  
(Japan)
  - 12. Telson shorter than 1.5 times as long as broad, with 2 pairs of spines on apex. ....  
.....*P. armatum* Hansen  
(Antarctic)
  - Telson equal to or slightly longer than 1.5 times as long as broad, with 3 pairs of spines  
on apex..... *P. belgicae* Holt and W. Tattersall  
(Antarctic)
  - 13. Telson without lateral spines..... (Nanum-Group) 14

- Telson with lateral spines .....17
- 14. Distal margin of telson somewhat concave, with 2 pairs of spines....*P. bispinicaudum* sp. nov.  
(East China Sea)
- Distal margin of telson truncate or broadly rounded, with 4 pairs of spines. ....15
- 15. Scale long, about twice as long as antennular peduncle; telson about 1 and 2/3 times as long as broad.....*P. antarcticum* Zimmer  
(Antarctic)
- Scale extending beyond antennular peduncle by 1/3 of scale at most. ....16
- 16. Terminal spine of outer margin of scale very slightly shorter than obtusely rounded apex; sexual difference which is most unusual among mysids present. ....  
.....*P. nanum* Holt and W. Tattersall  
(Ireland, Faroe Channel)
- Terminal spine of outer margin of scale clearly shorter than somewhat narrowly rounded apex; sexual difference which is usual in mysids present.....*P. marumoi* sp. nov.  
(Japan; East China Sea)
- 17. Strong spines on distal margin of telson with a closely set row of minute spinules on each side; a pair of plumose setae absent on distal margin of telson; fourth pleopod of male with endopod longer than exopod and bearing a single extremely long non-plumose seta on its penultimate segment. .... (*Calloplura* - Group)  
..... *P. calloplura* Holt and W. Tattersall  
(Ireland; Faroe Channel; Mediterranean Sea; Japan)
- Spines on distal margin of telson without minute spinules; a pair of apical plumose setae present on distal margin of telson; endopod of fourth pleopod of male without a single extremely long non-plumose seta on its penultimate segment. ....18
- 18. Lateral margin of telson with many spines arranged with larger spines in the spaces between smaller spines.....(*Longicaudum*- Group) 19
- Lateral margins of telson with sparse and subequal spines. ....20
- 19. Telson 3 times as long as broad..... *P. longicaudum* O. Tattersall  
(Palmer Archipelago)
- Telson 1.5 times as long as broad..... *P. lamellicaudum* sp. nov.  
(Japan)
- 20. Distal margin of telson with 5 pairs of spines which increase regularly the length from inner pair to outer.....(*Schollaertensis*-Group) 21
- Spines on distal margin of telson increase the length from outer pair to inner. ....  
..... (*Affine*-Group) 22
- 21. Eyeplate with about 25 fine teeth..... *P. schollaertensis* O. Tattersall  
(Palmer Archipelago)
- Eyeplate with about 10 coarse teeth..... *P. multispinosa* Birstein and Tchindonova  
(Western North Pacific off Japan)
- 22. Apex of scale nearly equal to or shorter than external spine of scale. ....23
- Apex of scale much longer than external spine of scale. ....26
- 23. Eyeplate with about 25 fine teeth..... *P. latiphthalmum* sp. nov.  
(Japan)
- Eyeplate with 9 to 14 coarse teeth.....24
- 24. Eyeplate with marked ridge on dorsal surface; scale 3 times as long as broad; telson with

- 8 to 10 lateral spines on each side.....*P. magellanicus* O. Tattersall  
(Magellan Str.)
- Eyeplate without such marked ridge on dorsal surface. ....25
25. Eyeplate with about 9 coarse teeth; apex of telson arcuate, armed with 3 pairs of long  
spines which are subequal in length.....*P. berkeleyi* W. Tattersall  
(Off British Columbia)
- Eyeplate with 14 coarse teeth; apex of telson truncate, armed with 3 pairs of spines, of which  
outermost pair much shorter than inner 2 pairs.....*P. crassidentatum* sp. nov.  
(Japan)
26. Terminal lobe of scale short, shorter than 1/5 of total length of scale.....27
- Terminal lobe of scale long, larger than 1/5 of total length of scale.....30
27. Distal margin of telson with 4 or 5 pairs of spines.....*P. sarsi* G. O. Sars  
(Antarctic; Japan)
- Distal margin of telson with 2 or 3 pairs of spines. ....28
28. Distal margin of telson with 2 pairs of spines. ....*P. okiyamai* sp. nov.  
(Japan Sea)
- Distal margin of telson with 3 pairs of spines. ....29
29. Distal margin of telson with 3 pairs of long spines.....*P. tanseii* sp. nov.  
(Japan)
- Distal margin of telson with 2 pairs of long spines and 1 pair of short spines.....  
.....*P. izuensis* Murano  
(Japan)
30. Telson truncate, with about 8 lateral spines on each side and 4 spines on apex. ....  
.....*P. truncatum* Smith  
(Circumpolar of Arctic)
- Telson linguiform, with apical spines increasing in length towards middle line.....31
31. Telson with 3 or 4 pairs of spines on apex. ....32
- Telson with 1 or 2 pairs of spines on apex. ....34
32. Endopod of uropod with a spine on inner margin near statocyst; apical lobe of scale short,  
1/7 to 1/4 of its total length.....*P. japonicum* Murano  
(Japan; East China Sea)
- Endopod of uropod with no spines on inner margin of statocyst region. ....33
33. Apex of telson broad, about half the width at its base.....*P. chattoni* Bacesco  
(Mediterranean Sea)
- Apex of telson narrow, about 2/5 of width at its base.....*P. affine* G. O. Sars  
(North Atlantic)
34. Smooth part of external margin of scale about twice as long as terminal lobe. ....  
.....*P. frigidum* Hansen  
(North Atlantic)
- Smooth part of external margin of scale 1.5 times as long as terminal lobe. ....  
.....*P. roseum* G. O. Sars  
(North Atlantic)

*Pseudomma matsuei* MURANO 1966

*Pseudomma matsuei* Murano, 1966: 41-42.

Occurrence : St. 84-3, 4 adult (14.1-15.5 mm) and 4 immature females.

*Pseudomma surugae* sp. nov.

(Figs. 1, 2)

*Pseudomma* sp., Murano, 1970a: 254-256; 1970b: 144.

Occurrence : St. S1, 1 immature male (2.9 mm).

St. S2, 1 adult female (only posterior half of body).

St. 221-5, 1 adult female (7.9 mm).

St. 293-2, 3 adult females (7.1-8.0 mm) and 1 near adult male.

St. 293-3, 7 adult females (6.8-7.9 mm, of these 3 specimens of 7.0, 7.4 and 7.5 mm with embryos), 3 adult (6.0-6.2 mm) and 3 immature males.

Description :

General form compact (Fig. 1, a). Carapace with evenly arched anterior margin, no trace of any projected rostrum ; antero-lateral corner produced in dorsal view (Fig. 1, a, b) ; posterior margin emarginate, leaving last thoracic somite exposed dorsally (Fig. 1, a). Eye composed of 2 contiguous plates with a small median cleft ; in female each plate with antero-lateral corner broadly rounded ; in male the plate with straight anterior margin and more developed antero-lateral corner than in female ; no trace of serrulation or teeth on margin ; slightly hispid near median cleft on anterior margin (Fig. 1, a, b). Antennular peduncle robust ; first somite armed with a few setae on outer distal corner ; second somite shortest, armed on inner margin with a prominent seta in female, armed on outer margin with a few setae which are more developed in male than in female ; third somite longest, as long as preceding 2 somites together ; male appendage from third somite large, very hirsute (Fig. 1, a, b). Antennal peduncle slender, longer than antennular peduncle ; first somite short, as wide as long ; second somite as long as third somite, slightly less than twice as long as wide ; third somite a little more than twice as long as wide (Fig. 1, a, b). Antennal scale rather small, extending beyond distal border of antennal peduncle by distal 1/7 to 1/8 of its length and of antennular peduncle by distal 1/4, about 3 times as long as wide ; external margin smooth and straight, ending in a large spine ; apex of scale only slightly longer than spine of external margin ; terminal lobe small, occupying only 1/9 to 1/10 of total length of scale (Fig. 1, c). Mouth parts almost same to those of congeners of this genus (Fig. 1, d, e, f). First thoracic endopod with carpus about 1 and 1/3 times as long as propodus (Fig. 1, g) ; second thoracic endopod rather robust ; carpus about 6.5 times as long as wide, about 1 and 1/5 times as long as propodus ; propodus about



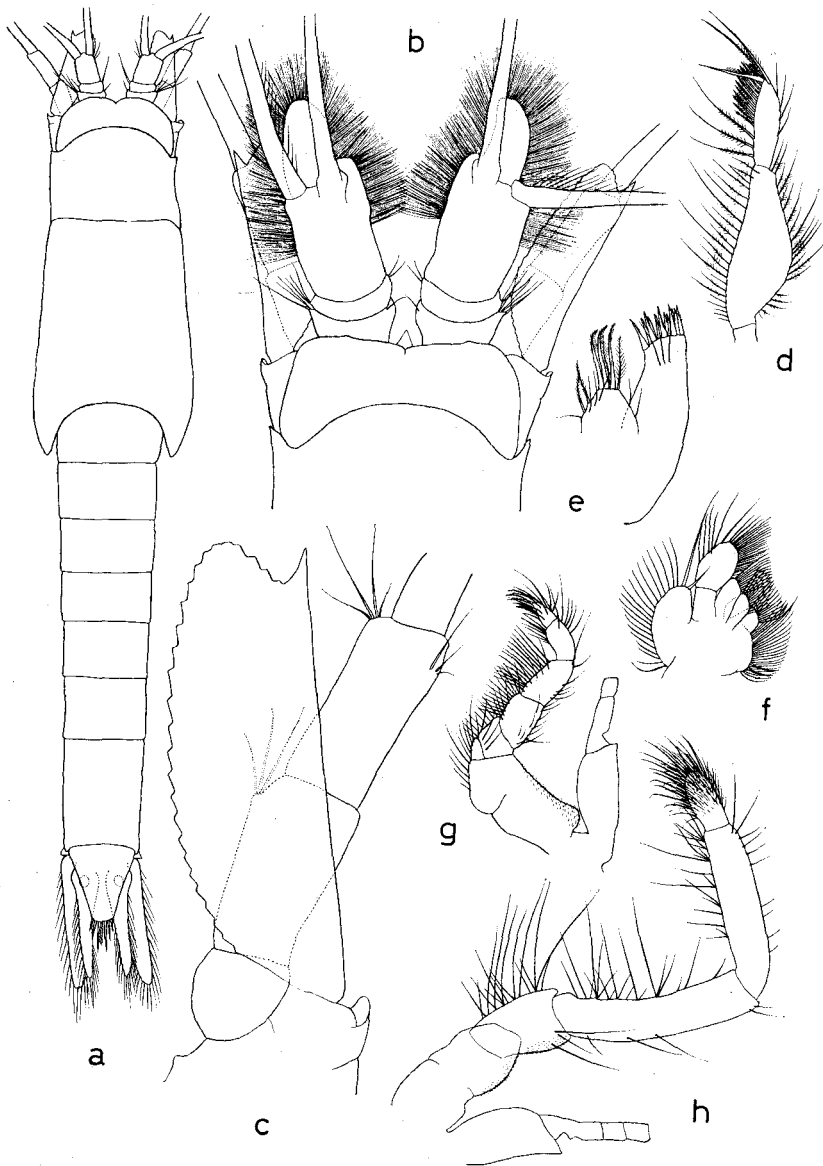


Fig. 1. *Pseudomma surugae* sp. nov., a, adult female in dorsal view,  $\times 14$ ; b, anterior end of adult male,  $\times 84$ ; c, antennal peduncle and scale,  $\times 67$ ; d, palp of mandible,  $\times 34$ ; e, maxillule,  $\times 67$ ; f, maxilla,  $\times 34$ ; g, endopod of first thoracic limb,  $\times 34$ ; h, endopod of second thoracic limb,  $\times 34$ .

4.5 times as long as wide (Fig. 1, h). Abdomen 6-segmented ; first to fifth segments subequal ; sixth segment longest, 1 and 1/3 times as long as wide (Fig. 1, a). Pleopods in male biramous and natatory ; first pair with endopod short and unsegmented, exopod 9-segmented ; second to fifth pairs of legs with 2 rami of same length, 8- or

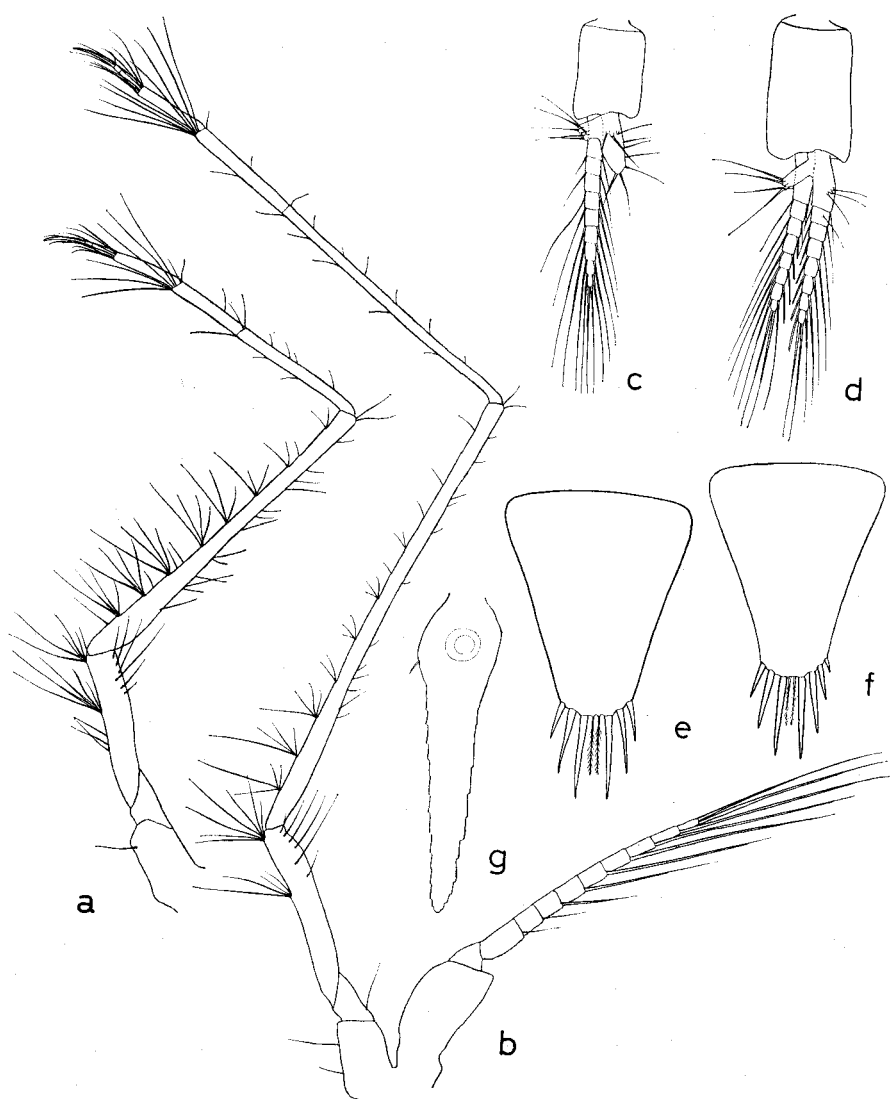


Fig. 2. *Pseudomma surugae* sp. nov., a, endopod of third thoracic limb,  $\times 34$ ; b, endopod of fourth thoracic limb,  $\times 34$ ; c, first pleopod of male,  $\times 34$ ; d, fourth pleopod of male,  $\times 34$ ; e, telson,  $\times 34$ ; f, telson,  $\times 34$ ; g, endopod of uropod,  $\times 34$ .

9-segmented (Fig. 2, c, d). Telson somewhat shorter than last abdominal segment, 1 and  $1/4$  times as long as its maximum width; distal margin rather rounded than truncate, furnished with a pair of median plumose setae and 3 or 4 pairs (rarely 3 on one side and 4 on the other side) of spines which become progressively shorter laterally, of which innermost pair of spines longest, more than  $1/3$  of total length of telson; lateral margin slightly concave and naked (Fig. 2, e, f). Uropod with exopod about 1 and  $2/3$  times as long as telson; endopod shorter than exopod, armed with a feeble spine at statocyst region on inner margin (Fig. 2, g).

Types :

Holotype, adult female of 7.9 mm; allotype, adult male of 6.2 mm; and 11 paratypes; all from St. 293-3.

Remarks :

The present species is identical with *Pseudomma* sp. which is reported by the present author for 2 specimens, a young male of 2.9 mm and a posterior half of the female estimated to be about 5 mm in total length, collected from Suruga Bay by the R/V Suruga-Marui. The present species most closely resembles *P. matsuei* Murano and *P. intermedium* sp. nov. among the genus by the possession of 2 characteristics: (1) Not a trace of serrulation or teeth is present on eyeplate. (2) Lateral margin of telson is smooth. However, the differences between the present species and *P. matsuei* are present as follows: (1) Antennal scale reaches beyond antennular peduncle by its distal half in *P. matsuei*, whereas in the present species only distal  $1/4$  of the scale extends beyond the antennular peduncle. (2) In *P. matsuei* a row of short, stout setae is present on distal  $1/3$  of inner margin of third segment of mandibular palp, while in the present species it is present on distal half of the inner margin. (3) Carpus of first thoracic endopod is about twice as long as propodus in *P. matsuei*, while about 1 and  $1/3$  times as long as propodus in the new species. (4) Second thoracic endopod of the present species is shorter and thicker than that of *P. matsuei*, for example, in the present species the length of carpus is 4.5 times the size of width, while in *P. matsuei* 6.5 times the size of width. (5) In *P. matsuei* the length of telson is more than 1.5 times the width and armed with 2 pairs of spines on distal margin, whereas in the present species the length of telson is about 1 and  $1/4$  times the width and armed with 3 or 4 pairs of spines. (6) Body lengths of adult females are 14 to 16 mm in *P. matsuei* and 7 to 8 mm in the present new species, respectively.

The differences from *P. intermedium* should be given later.

The differences from other species of the same genus are easily distinguishable by the combination of the eyeplate and telson.

The species is named for the R/V Suruga-Marui by which it was collected in the first place.

*Pseudomma intermedium* sp. nov.

(Figs. 3, 4)

Occurrence : St. 533, 1 adult (9.6 mm) and 1 immature (8.5 mm) females, 1 immature male (8.2 mm).

Description :

Body rather slender (Fig. 3, a). Carapace with frontal margin very slightly arcuate,

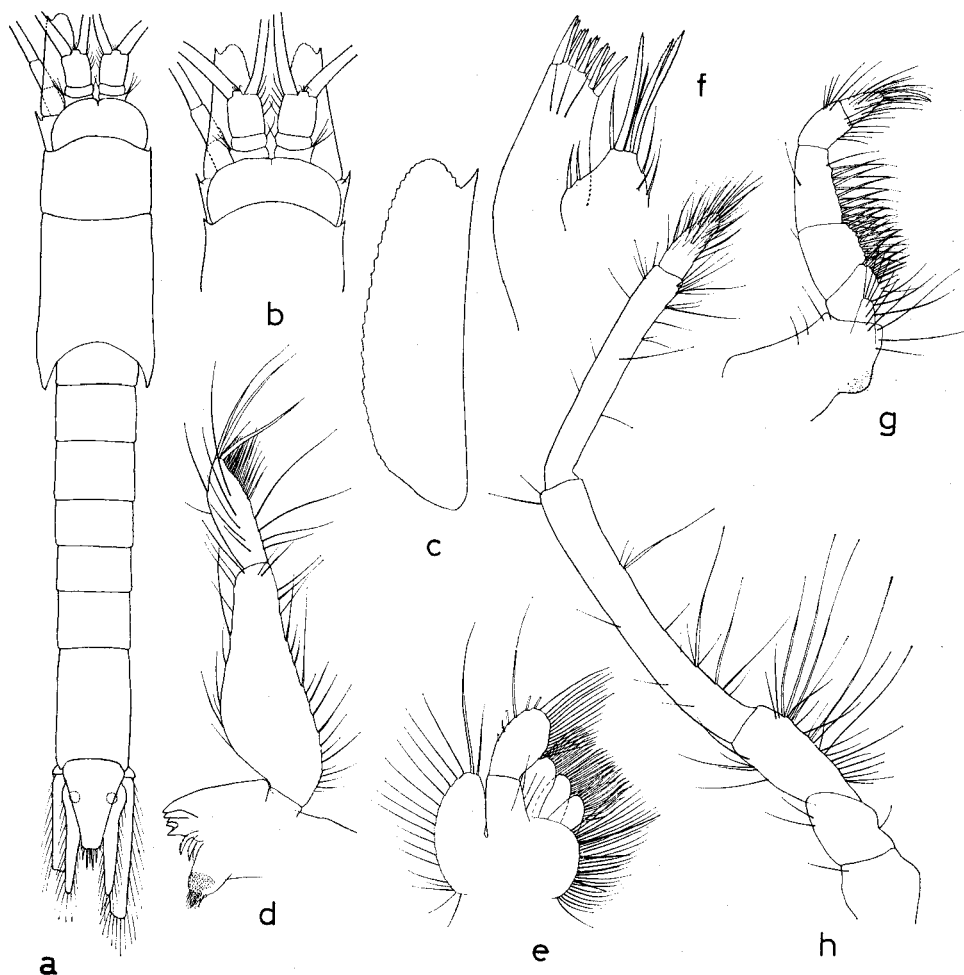


Fig. 3. *Pseudomma intermedium* sp. nov., a, adult female in dorsal view,  $\times 10$ ; b, anterior end of adult female,  $\times 14$ ; c, antennal scale,  $\times 34$ ; d, mandible,  $\times 39$ ; e, maxilla,  $\times 39$ ; f, maxillule,  $\times 78$ ; g, endopod of first thoracic limb,  $\times 39$ ; h, endopod of second thoracic limb,  $\times 39$ .

covering laterally all thoracic segments, but dorsally exposing last one behind its posterior emargination; cervical sulcus well marked (Fig. 3, a, b). Eyeplate semicircular with median notch, covering basal  $2/3$  of first segment of antennular peduncle, no serrulation or armature of any kind (Fig. 3, b). Antennular peduncle short and robust; basal joint armed on outer distal corner with a few setae; middle joint very short, armed on inner margin with a single long seta; distal joint longer than both of the other two, the length being 1 and  $1/3$  times the width, armed on inner margin with several setae (Fig. 3, b). Antennal peduncle slender, as long as antennular peduncle; first joint short, as long as broad; third joint equal to second one in length, more than twice the size of breadth. Antennal scale not so long, extending beyond distal border of antennular peduncle by about  $1/3$  of its length, about 3.5 times as long as broad; external margin naked, slightly concave, ending into a strong spine which does not reach a little to rounded apex of scale (Fig. 3, c). Mouth parts almost same to those of other species of the genus *Pseudomma* (Fig. 3, d, e, f). First thoracic endopod with carpus about 1 and  $2/3$  times as long as propodus (Fig. 3, g); second thoracic endopod with carpus nearly as long as the length of propodus and dactylus combined (Fig. 3, h). Abdomen 6-jointed; first 5 somites subequal; last somite long, twice as long as the preceding one (Fig. 3, a). Pleopods in male biramous and natatory; first pair with endopod short, broadened, flattened and unsegmented, exopod 8-jointed; second to fifth pairs with endopod and exopod subequal in length, 8- to 9-jointed (Fig. 4, a, b). Present specimen of male is judged with an immature since setae from each segment of pleopod are not developed in full, then the segment would be increased its number with the progress of growth. Telson rather long and truncate, about 1.5 times as long as broad at base, clearly shorter than last abdominal somite; lateral margin smooth, slightly concave; distal margin less than  $1/3$  of maximum width at base of telson, armed with 3 or 4 pairs of spines (normally 3), of which innermost pair longest, about  $1/5$  of length of telson, and outermost pair very short. A pair of median plumose setae present (Fig. 4, c, d). Uropod long and slender; exopod twice as long as telson, extending beyond apex of endopod by  $1/5$  to  $1/6$  of its length; endopod extending beyond telson by its distal  $2/5$ , armed with a single, small, feeble spine on inner margin at region of statocyst.

#### Types :

Holotype, immature female with half-grown marsupium of 8.5 mm; allotype, immature male of 8.2 mm; and paratype, adult female of 9.6 mm.

#### Remarks :

The present new species is very closely related to *Pseudomma matsuei* Murano and *P. surugae* sp. nov., especially to the former, obtained from the vicinity of the present locality in the eyeplate without serrulation or denticles and the naked lateral margin of the telson. The differences between the present species and *P. matsuei* are present

as follows: (1) Antennal scale extends beyond distal margin of antennular peduncle by distal 1/3 of its length in the present species, while by distal half in *P. matsuei*. (2) Second thoracic endopod is more slender in *P. matsuei* than in the present species; the carpus is barely equal to length of propodus and dactylus together in the present species, whereas it is clearly shorter than the following 2 segments combined. (3) Telson is furnished with 3 or 4 pairs of spines on the distal margin in the present species, while with 2 pairs in *P. matsuei*.

Among the present 3 specimens a couple of immature near adult were available for the present description since they were in relatively good condition. Therefore, in comparison with *P. matsuei*, there are entertained misgivings that the minute differ-

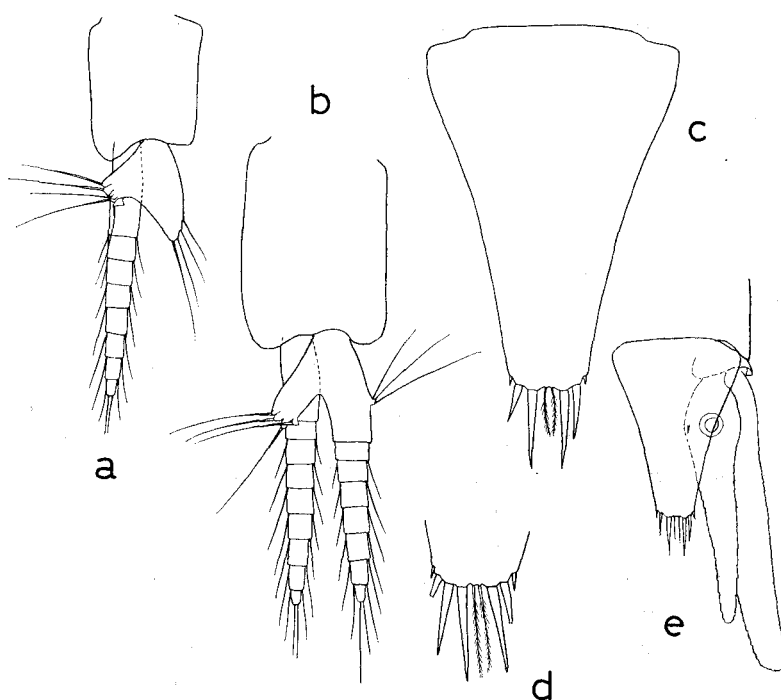


Fig. 4. *Pseudomma intermedium* sp. nov., a, first pleopod of immature male,  $\times 49$ ; b, fourth pleopod of immature male,  $\times 49$ ; c, telson,  $\times 42$ ; d, posterior end of telson of immature male,  $\times 49$ ; e, telson and uropod,  $\times 20$ .

ences mentioned above were caused by the stage of the growth. However, it is believed that they are recognized as specific differences, because they were also confirmed in a young specimen of *P. matsuei* of ca. 8.6 mm with only a bud of marsupium. In this young specimen the armature on the distal margin of the telson is broken off, but it is supposed that there were originally only 2 pairs of spines.

The present species is also distinguishable from the other species, *P. surugae*, in

following respects: (1) Antennal peduncle is as long as antennular peduncle in the present species, while it is longer than antennular peduncle in *P. surugae*. (2) Length of scale is 3.5 times as long as its breadth and scale extends beyond distal border of antennular peduncle by  $1/3$  of its length in the present species, whereas in *P. surugae* scale is 3 times as long as broad and extends beyond the border of peduncle by  $1/4$  of its length. (3) Second thoracic endopod is more slender and its carpus is nearly equal to length of following 2 segments combined in the present species, while it is more robust and its carpus is clearly shorter than following 2 segments combined in *P. surugae*. (4) In the present species telson is long and about 1.5 times as long as broad, whereas in *P. surugae* it is short and about 1 and  $1/4$  times.

The present new species is clearly distinguished from the other species of the genus in the combination of 2 characteristics, scale and telson.

This species is named for the intermediate form between *P. matsuei* and *P. surugae*.

*Pseudomma longisquamosum* sp. nov.

(Fig. 5)

Occurrence : St. 341, 2 adult (only anterior half of body) and 1 immature (7.5 mm) females, 1 adult (badly damaged) and 3 immature (9.3, 10.0 mm, the other one only posterior half) males.

Description :

Body rather compact. Carapace with anterior margin short and only slightly convex (Fig. 5, a, b); posterior margin emarginate, exposing last thoracic segment dorsally. Eyeplate somewhat large, covering basal half of first segment of antennular peduncle; anterior margin nearly straight with distinct median notch; no teeth or serrulation on whole margin (Fig. 5, a, b). Antennular peduncle 3-segmented, somewhat more robust in male than in female; outer distal corner of first segment produced into somewhat acute process and armed with a few setae; second segment shortest; third segment longer than preceding 2 segments together, about 1 and  $1/3$  times as long as broad (Fig. 5, a, b). Antennal peduncle consisting of 3 segments, much shorter than antennular peduncle; first segment short, as long as broad; second and third segments equal in length, twice as long as broad (Fig. 5, c). Antennal scale long and narrow, extending beyond distal margin of antennular peduncle by distal  $1/3$  of its length, about 4.5 times as long as broad; external margin smooth and slightly concave, terminating into a very strong spine; apex of scale rounded, very slightly longer than terminal spine of external margin (Fig. 5, c). Pleopods of male biramous; the first pair with short, broad, flattened and unsegmented endopod, exopod 11-segmented; both the endopods and exopods of second to fifth pairs subequal, 9- or 10-segmented (Fig. 5, d, e). Setae on pleopods are not yet developed fully, so that the segment will be increased in number. Telson truncate, 1 and  $1/4$  times as long as maximum width at base; apex

relatively narrow,  $1/4$  of width at base, armed with 2 pairs of long spines, of which inner pair is much longer than outer pair and about  $1/4$  of length of telson; a pair of median plumose setae present; lateral margin slightly concave, furnished on its distal half with 11 to 13 small spines. These spines are arranged densely and are irregular in length except distal 2 spines which are comparatively long (Fig. 5, f). Uropod slender; exopod long, about twice as long as telson; endopod about  $2/3$  of length of exopod, reaching beyond distal margin of telson by its distal half, armed with a single feeble spine on inner margin at statocyst region (Fig. 5, g, h).

Types :

Holotype, immature male of 10.0 mm; paratypes, the other 6 specimens from St. 341.

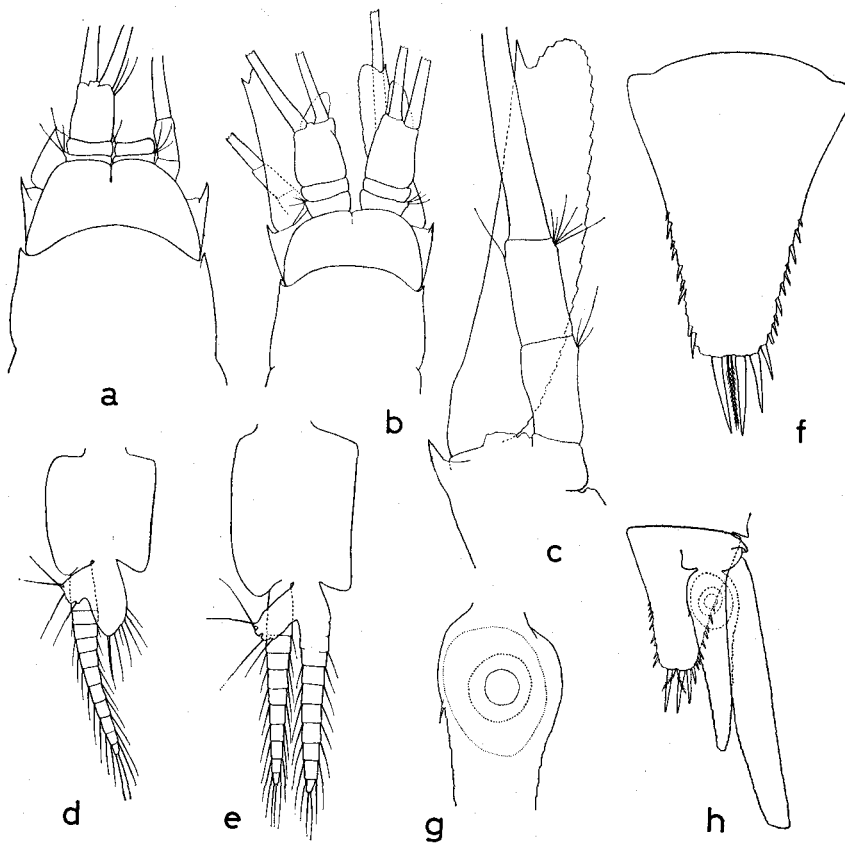


Fig. 5. *Pseudomma longisquamosum* sp. nov., a, anterior end of adult female,  $\times 16$ ; b, anterior end of immature male,  $\times 14$ ; c, antennal peduncle and scale,  $\times 34$ ; d, first pleopod of immature male,  $\times 34$ ; e, fourth pleopod of immature male,  $\times 34$ ; f, telson,  $\times 34$ ; g, basal half of endopod of uropod,  $\times 39$ ; h, telson and uropod,  $\times 16$ .



## Remarks :

The present specimens have been fairly damaged since they were collected together with a bulk of muds in the towing of the bottom-net, but the specific characters, such as eyeplate, antennal scale and telson, have been kept in comparatively good condition.

The present species is most closely allied to *P. belgicae* Holt and W. Tattersall from the Antarctic Ocean. The former species, however, differs from the latter in the following respects: (1) Antennal peduncle is clearly shorter than antennular peduncle in the present species, while it is as long as antennular peduncle in *P. belgicae*. (2) Telson is armed with 11 to 13 spines on distal half of lateral margin and with 2 pairs of long spines on apex in the present species, whereas in *P. belgicae* it is armed with 5 to 9 spines on distal half of lateral margin and with 3 or 4 pairs of long spines on apex. (3) Body lengths are about 10 mm in near adult female of this species, and 22 to 26 mm in female and 23 to 27 mm in male of *P. belgicae*.

The present new species is easily distinguishable by the combination of 3 characters, eyeplate, scale and telson.

The name *longisquamosum* refers to the length of the antennal scale.

*Pseudomma brevisquamosum* sp. nov.

(Fig. 6)

Occurrence : St. 533, 2 adult females (8.9, 8.6 mm).

## Description :

General form compact (Fig. 6, a). Carapace with very broadly rounded anterior margin, without projected rostrum; cervical sulcus well marked in lateral view; posterior margin emarginate, leaving last abdominal somite uncovered (Fig. 6, a, b). Eyeplate reaching the middle of first segment of antennular peduncle, any kind of serrulation or denticles absent on whole margin; anterior margin nearly straight with a median cleft; antero-lateral angle somewhat produced with rounded corner, so that the plate is sub-rectangular in dorsal view (Fig. 6, b). Antennular peduncle short and thick; first segment with outer distal corner produced and armed with a few setae; second segment short, about twice as wide as long; third segment longer than either of the other 2 segments, length being larger than breadth (Fig. 6, b). Antennal peduncle slender, reaching beyond antennular peduncle by distal 1/3 of its third segment; first segment short, length being less than breadth; second segment long, more than twice the breadth, armed with a few plumose setae on inner distal corner; third segment somewhat shorter than preceding one, armed with several plumose setae at inner distal corner (Fig. 6, c). Antennal scale rather short and broad, extending beyond distal margin of antennular peduncle by its distal 1/3 and beyond margin of antennal peduncle by its distal 1/4, slightly shorter than 3 times of the breadth; apex of scale extending by a short distance beyond strong spinous process which terminates in un-

armed outer margin; terminal lobe of length less than breadth, about only  $1/6$  of total length of scale (Fig. 6, c). Mouth parts and first thoracic endopod exhibit no prominent differences with those of other species of the genus (Fig. 6, d, e, f, g). Second thoracic endopod long and slender, with propodus a little longer than carpus (Fig. 6, h). First 5 abdominal segments subequal; sixth segment longest, about twice as long as the length of preceding ones, 1.5 times as long as broad (Fig. 6, a). Telson trapezium in shape, of almost same length as last abdominal segment, 1 and  $2/3$  times as long as broad at base; distal margin less than half the width at base, armed with a pair of plumose setae and 3 pairs of spines, of which inner 2 pairs are subequal and about  $1/5$  to  $1/6$  times as long as telson; outermost pair short, equal to or less than 2 inner pairs in length; lateral margin nearly straight, armed with about 5 short spines (Fig. 6, i). Uropod not so long, outer pair extending beyond apex of telson by its distal  $1/3$ , inner pair almost same level as tip of spines on distal margin of telson, furnished on inner margin at statocyst region with a single feeble spine (Fig. 6, a).

Male unknown.

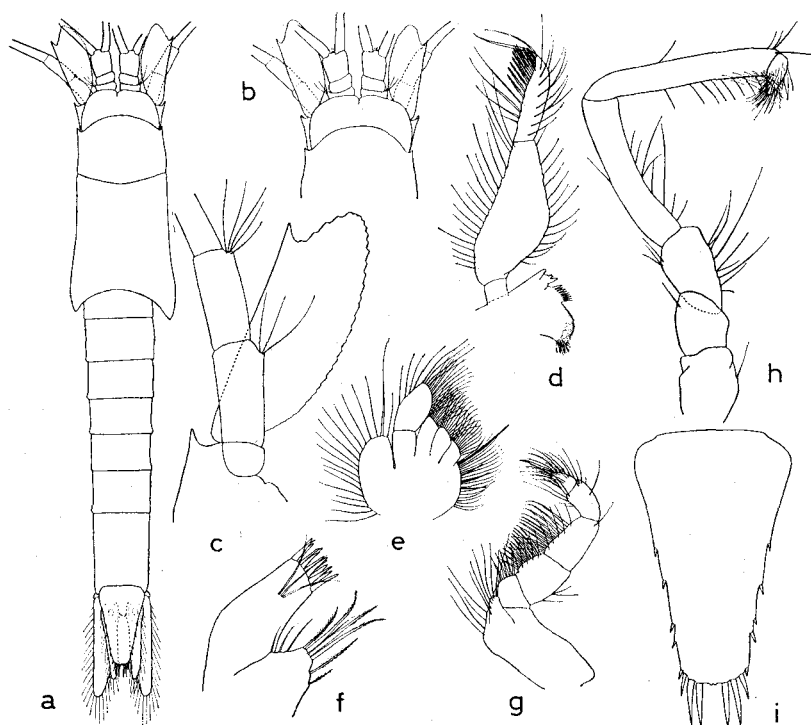


Fig. 6. *Pseudomma brevisquamosum* sp. nov., a, adult female in dorsal view,  $\times 8$ ; b, anterior end of adult female,  $\times 11$ ; c, antennal peduncle and scale,  $\times 28$ ; d, mandible,  $\times 28$ ; e, maxilla,  $\times 28$ ; f, maxillule,  $\times 55$ ; g, endopod of first thoracic limb,  $\times 28$ ; h, endopod of second thoracic limb,  $\times 28$ ; i, telson,  $\times 28$ .

## Types :

Holotype, adult female of 8.9 mm ; paratype, adult female of 8.6 mm.

## Remarks :

The present form is most closely related to *Pseudomma calmani* O. Tattersall obtained from off Falkland Islands in shapes of the eyeplate, antennal scale and telson. However, it differs from the latter in the following minor points: (1) In the present form, scale is in length slightly less than 3 times of the breadth, and terminal lobe occupies only 1/6 of total length of scale, while in *P. calmani* scale is 3.5 times as long as broad and terminal lobe occupies 1/5 of total length of scale. (2) Telson is 1 and 2/3 times as long as broad at base in the former, whereas it is 1.5 times in the latter. (3) In the present form apex of telson is rather truncate than rounded in shape and bears 3 pairs of spines, in which inner 2 pairs are subequal and about twice as long as outermost. While in the latter it is broadly rounded and bears 3 pairs of long spines which increase in length towards middle line.

Although these differences are very small, I think it rather better to establish a new species after due consideration that there is a great distance of geographical range between the habitats of these two forms.

The present species is also allied to *P. belgicae* Holt and W. Tattersall and *P. armatum* Hansen from the Antarctic in the eyeplate and telson. However, there is a great difference in the body length between the former and the two latters. Namely, it is only 8.6 to 8.9 mm in adult female of the present species, while it is nearly 30 mm (W. Tattersall, 1908) in *P. belgicae* and 17 mm (Hansen, 1913) to 22.4 mm (O. Tattersall, 1955) in *P. armatum*. Besides the difference in size, from *P. belgicae* some differences are found in the antennal scale and second thoracic endopod as follows: (1) In the present species antennal scale is extending beyond antennular peduncle by distal 1/3, and slightly shorter than 3 times of the breadth, whereas in *P. belgicae* it is twice as long as antennular peduncle, and about 3.5 times as long as broad. (2) In the present species apex of scale extends by a short distance beyond spine which terminates in unarmed outer margin, while in *P. belgicae* it is only slightly produced beyond terminal spine.

*P. brevisquamosum* sp. nov. is also distinguishable from *P. armatum* which has following characteristics: (1) Apex of antennal scale is longer than (as in *P. belgicae*) or equal to tooth terminating in outer margin. (2) Telson is of length less than 1.5 times as long as broad and armed on distal margin with only 2 pairs of long spines.

From the other species of the genus the present new species is easily distinguished in the combination of the characters of the eyeplate, antennal scale and telson.

The name *brevisquamosum* refers to the length of the antennal scale.

*Pseudomma bispinicaudum* sp. nov.

(Fig. 7)

Occurrence : St. H35, 2 adult males (4.1, 4.3 mm).

## Description :

Body short and thick (Fig. 7, a). Carapace with evenly rounded anterior margin, without produced rostrum; antero-lateral corner acutely pointed in dorsal view; posterior margin emarginate, leaving last thoracic segment uncovered (Fig. 7, a). Eyeplate subrectangular, with very small median cleft on nearly straight anterior margin; antero-lateral corner developed and produced forwards, armed with 17 to 19 small denticles; lateral margin straight and smooth (Fig. 7, a). Antennular peduncle robust; basal somite armed with a few setae at strongly produced outer distal corner; middle somite short and narrow; distal somite largest, a little longer than width; outer margin swollen at basal corner; male appendage from the third somite large and very hirsute (Fig. 7, a). Antennal peduncle slender, as long as antennular peduncle; basal somite shortest, as long as broad; middle somite about twice as long as preceding one, armed with a few setae near distal corner on inner margin; distal somite longest, slightly shorter than 2 preceding ones combined, armed with about 7 setae at inner distal corner and about 3 setae on outer margin (Fig. 7, b). Antennal scale moderate, distal  $1/4$  of scale extending beyond distal margin of antennal peduncle, about 3.5 times as long as wide; external margin naked and nearly straight, terminating in a strong spinous process; terminal lobe occupying about  $1/6$  of total length of scale, about 3 times as long as terminal spine of outer margin (Fig. 7, b). Mandibular palp with third segment armed with a row of short stout setae on major part of inner margin (Fig. 7, c). Maxilla, maxillule and first thoracic endopod similar to those of the members of this genus (Fig. 7, d, e, f). Second thoracic endopod rather slender; carpus slightly curved inwards, about as long as propodus and dactylus combined (Fig. 7, g). Abdomen 6-segmented; first to fifth somites subequal; sixth somite longest, twice as long as fifth, equal to or a little shorter than width (Fig. 7, a). Pleopods in male developed and natatory; first pair with short, unsegmented endopod and 7-segmented exopod; second to fifth pairs with 2 rami of same length, 5- or 6-segmented (Fig. 7, h, i). Telson somewhat longer than last abdominal somite, about 1 and  $1/5$  times as long as broad; lateral margin smooth, slightly curved inwards, terminating in a short spinous process; distal margin about  $1/3$  of maximum width of telson, slightly concave armed with a pair of plumose setae and 2 pairs of spines, of which inner pair is about  $1/5$  of length of telson and is longer than outer pair by  $1/3$  of its length (Fig. 7, j). Uropod relatively short, with exopod extending beyond distal border of telson by  $2/5$  of its length; endopod considerably shorter than exopod, tapering, armed with a single spine on inner margin at region of statocyst (Fig. 7, a, k).

Female unknown.

## Types :

Holotype, adult male of 4.3 mm; paratype, adult male of 4.1 mm.

## Remarks :

The present new species is immediately distinguishable from the other species of

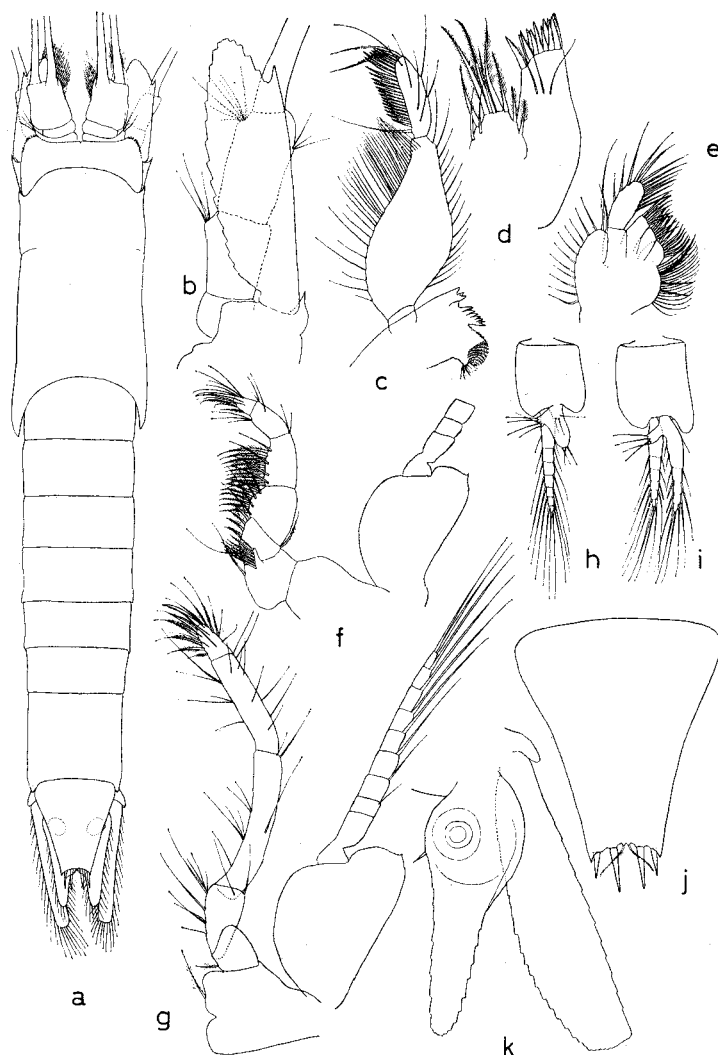


Fig. 7. *Pseudomma bispinicaudum* sp. nov., a, adult male in dorsal view,  $\times 22$ ; b, antennal peduncle and scale,  $\times 55$ ; c, mandible,  $\times 55$ ; d, maxillule,  $\times 110$ ; e, maxilla,  $\times 55$ ; f, first thoracic limb without distal half of exopod,  $\times 55$ ; g, second thoracic limb,  $\times 55$ ; h, first pleopod of male,  $\times 28$ ; i, fourth pleopod of male,  $\times 28$ ; j, telson,  $\times 55$ ; k, uropod,  $\times 55$ .

*Pseudomma* by so peculiar feature in the telson that the distal margin shows slight concavity and the distal end of lateral margin is pointed posteriorly into a small tooth. In addition to the characteristics of the telson, it seems to be also available for the identification in the following two respects, the short sixth abdominal somite and the short stout setae arming in a major part of the inner margin of the third segment of mandibular palp.

The name *bispinicaudum* refers to the shape of the telson.

*Pseudomma marumoi* sp. nov.

(Figs. 8, 9, 10)

*Pseudomma* sp., Murano, 1970b: 143.

Occurrence : St. 221-5, 1 adult male (6.1 mm).

St. 293-3, 1 adult female with embryos (6.0 mm), 1 adult (6.0 mm) and 1 near adult (5.6 mm) males.

St. 391-1, 1 adult female (4.5 mm).

St. 392-1, 2 adult (4.5, 4.8 mm) and 2 immature females, 1 adult (4.1 mm) and 3 immature males.

St. 557-1, 2 adult males (4.7 4.8 mm).

St. H36, 1 adult (4.1 mm) and 3 immature females, 2 adult males (3.9 mm).

Description :

Body relatively slender (Fig. 8, a). Carapace short, with evenly rounded anterior margin, without any rostral projection; posterior margin emarginate, leaving last thoracic segment exposed dorsally; cervical sulcus clearly marked (Fig. 8, a, b, c). Ocular lamina with shallow cleft in middle line, composed of 2 subrectangular contiguous plates; in female each plate arcuate forwards at central region of its anterior margin, with broadly rounded outer distal corner; in male the plate with rather straight anterior margin and a more pronounced outer distal corner than in female; antero-lateral angle armed with 20 to 23 fine denticles (Fig. 8, b, c). Antennular peduncle robust, especially in male; first segment wide, with projecting outer distal corner armed with a few setae; second segment shortest, armed with a plumose seta on inner margin; third segment longest, 1 and 1/4 times as long as wide, and 3 to 4 times as long as second segment (Fig. 8, b, c). Antennal peduncle slender, slightly longer than antennular peduncle; first segment short as wide as long; second segment 1 and 1/3 times as long as wide, armed with a few setae on outer margin near distal end; third segment, longest, about twice as long as wide, 1 and 1/4 times as long as preceding one (Fig. 8, b, c). Antennule and antenna furnished with some rows of spinules. In present specimens these spinules are remarkable in female than in male (Fig. 8, b, c). Antennal scale rather short, extending beyond distal border of antennular peduncle by 1/3

in female and by  $1/4$  in male of its length, somewhat longer than antennal peduncle, about 3.5 times as long as wide; external margin straight and smooth, terminating in a strong spine which is somewhat shorter than apex of scale; terminal lobe small, occupying only  $1/7$  to  $1/8$  of length of scale (Fig. 8, d). Mouth parts and first thoracic endopod of usual type found in the genus (Fig. 8, e, f, g; Fig. 9, a). Second thoracic endopod somewhat slender, its carpus longer than propodus by  $1/5$  of its length (Fig. 9, b). Abdomen consisting of 6 segments; first to fifth segments subequal;

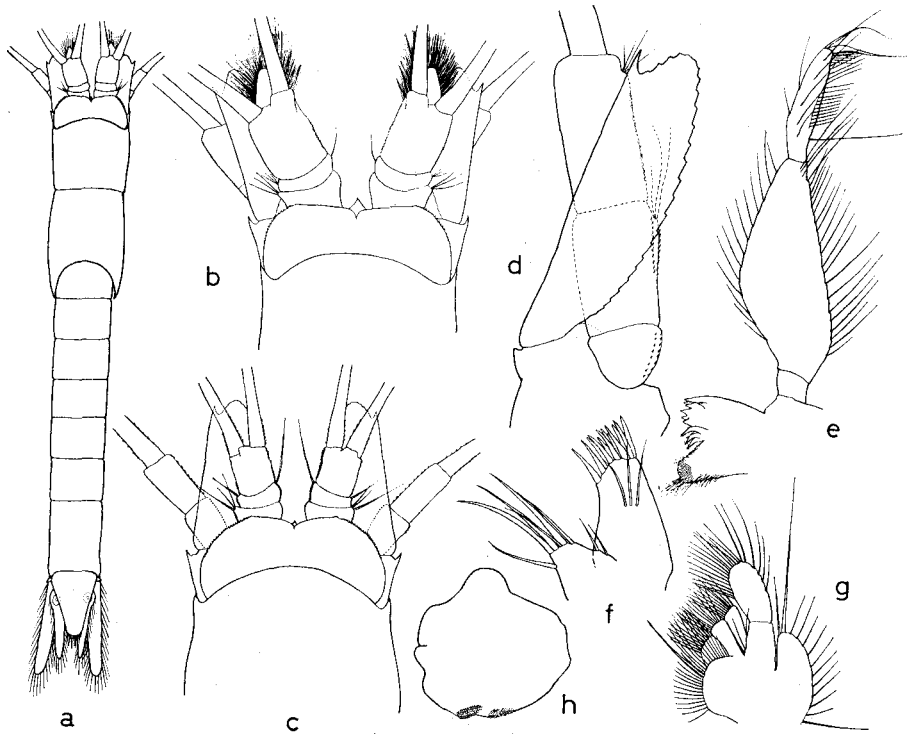


Fig. 8. *Pseudomma marumoi* sp. nov., a, adult male in dorsal view,  $\times 11$ ; b, anterior end of adult male,  $\times 28$ ; c, anterior end of adult female,  $\times 28$ ; d, antennal peduncle and scale,  $\times 55$ ; e, mandible,  $\times 55$ ; f, maxillule,  $\times 110$ ; g, maxilla,  $\times 55$ ; h, labrum,  $\times 110$ .

sixth segment longest,  $1 \text{ and } 2/3$  times as long as fifth,  $1 \text{ and } 1/3$  times as long as wide (Fig. 8, a). Pleopods in female rudimentary. In male pleopods biramous and natatory except in endopod of first pair; endopod of first pair reduced to a single segment bearing 8 setae on inner margin and apex, lateral lobe short and thick, armed with 4 setae; exopod 8-segmented; second to fifth pairs with 2 rami of almost same length, 6- or 7-segmented (Fig. 9, c, d). Telson slightly shorter than sixth abdominal segment, about  $1 \text{ and } 2/3$  times as long as wide at base; lateral margin naked, slightly concave; distal margin less than  $1/3$  of maximum width at base, rather broadly

rounded than truncate, armed with a pair of median plumose setae and 4 pairs of spines which become progressively shorter laterally, and of which innermost pair of spines about  $2/7$  of length of telson (Fig. 9, e). Endopod of uropod shorter than exopod, armed on inner margin near region of statocyst with a single feeble spine (Fig. 9, f).

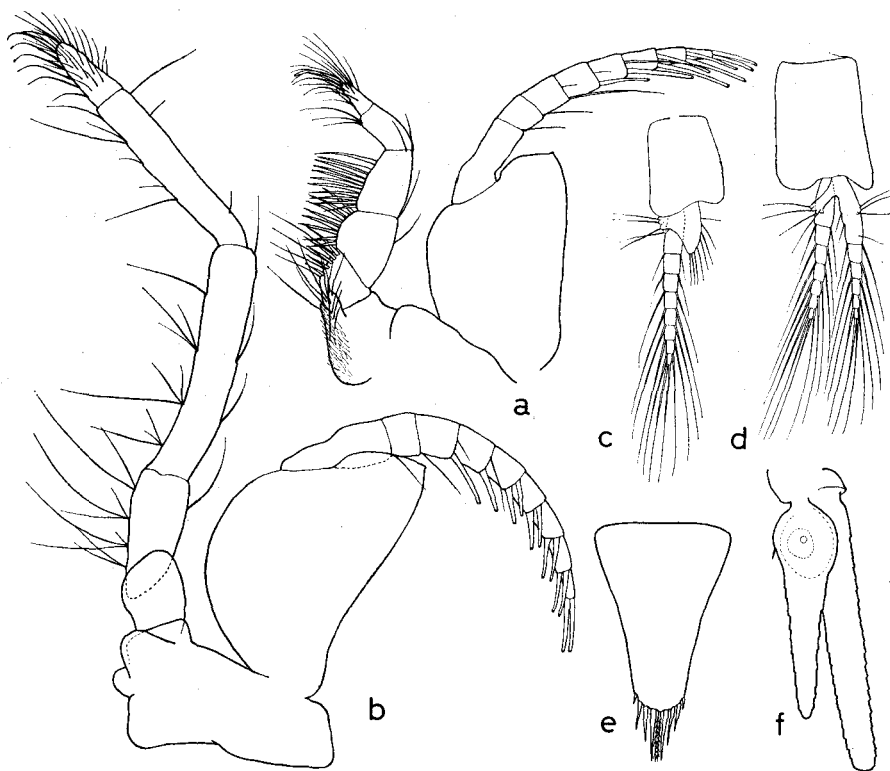


Fig. 9. *Pseudomma marumoi* sp. nov., a, first thoracic limb,  $\times 67$ ; b, second thoracic limb,  $\times 67$ ; c, first pleopod of male,  $\times 34$ ; d, fourth pleopod of male,  $\times 34$ ; e, telson,  $\times 34$ ; f, uropod,  $\times 34$ .

Types :

Holotype, adult male from St. 221-5, 6.1 mm; allotype, adult female with embryos from St. 293-3, 6.0 mm; and paratypes, 2 males from St. 293-3.

Remarks :

The present species closely allied to *P. nanum* Holt and W. Tattersall, especially to the male of it, from the west and south-west coasts of Ireland and Faroe Channel in the general form, in antennular and antennal peduncles, and in shape and armature



of telson. However, the specific differences between both species, *P. marumoi* sp. nov. and *P. nanum*, are found in following points: (1) In *P. nanum* the sexual difference which is most unusual among mysids is present in antennal peduncle. While in the present species the difference is small and usual in mysids, the antennal peduncle of both male and female are allied to that of the male of *P. nanum*, but not to that of the female. (2) In *P. nanum* outer margin of scale is terminating in a spine which is very slightly shorter than obtusely rounded apex, whereas in the present species it is terminating in a spine which is clearly shorter than somewhat narrowly rounded apex. (3) Antennule and antenna are furnished with some rows of spinules in the present species, but it is absent in *P. nanum* (4) Endopod of uropod armed on inner margin near region of statocyst with a single spine in the present species, while no spines are present on same position in *P. nanum*.

Out of the present collection some differences in the body length and the shapes of telson are present between the type specimens from the deeper bottom of Sagami Bay and those from the shallower bottoms of Suruga Bay and East China Sea (Fig. 10).

The specimens from Suruga Bay are different from the type as follows: (1) Scale is about 3 times as long as broad (Fig. 10, a). (2) Length of telson is only a little larger than the breadth at base and its distal margin is only slightly less than half the width at base (Fig. 10, c). (3) Body length is about 4.5 mm.

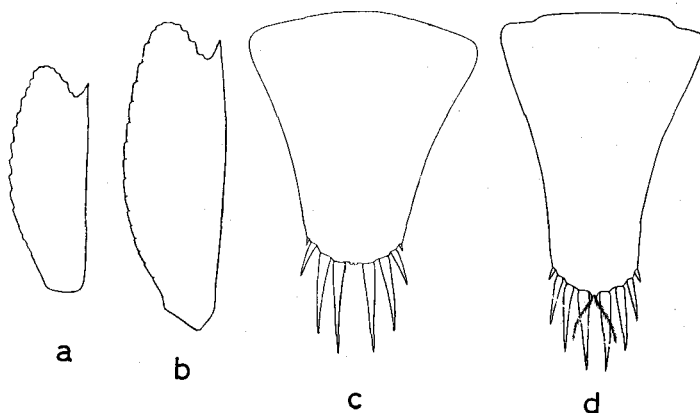


Fig. 10. *Pseudomma marumoi* sp. nov., a, antennal scale from St. 391-1,  $\times 67$ ; b, antennal scale from St. H36,  $\times 67$ ; c, telson from St. 391-1  $\times 67$ ; d, telson from St. H36,  $\times 67$ .

The specimens from the East China Sea have following characteristics: (1) Antennal scale is relatively short, and about 3 times as long as broad (Fig. 10, b). (2) Distal margin of telson is rather wide and more than  $2/5$  times of the width at base (Fig. 10, d). (3) Body length is about 4 mm.

No spinules are present on antennule and antenna in the specimens from the both localities, Suruga Bay and the East China Sea. It is questionable whether or not these specimens, especially those from Suruga Bay, should be held in the present species, since there is a very large difference in the shape of telson. However, I have decided to place them within the same species, taking account of a serious view of the resemblance of general form and the similarity in the telson with naked lateral margin and with distal margin furnished with 4 pairs of spines.

The species is named for Professor Ryuzo Marumo, Ocean Research Institute, University of Tokyo, who encouraged throughout this work.

*Pseudomma lamellicaudum* sp. nov.

(Figs. 11, 12)

Occurrence : St. 533, 6 adult (11.2-11.7 mm) and 1 immature females, 1 adult in badly damaged and 5 immature (9.3-9.6 mm) males.

St. 574, 2 immature females (9.5, 10.1 mm).

Description :

Body compact (Fig. 11, a). Carapace short, exposing posterior half of last thoracic segment in lateral view; anterior margin somewhat convex and evenly rounded, without projected rostrum; posterior margin emarginate, exposing entirely last thoracic segment in dorsal view (Fig. 11, a, b, c). Eyeplate rather wide, with nearly straight frontal margin in male, semicircular in female, a small incision present on median line of the plate; antero-lateral margins armed with a row of about 20 denticles, of which about 10 denticles at centre of row are much larger than those on both sides (Fig. 11, b, c). Antennular peduncle somewhat robust in male than in female; first segment covered by eyeplate for its basal half, armed with a few plumose setae at outer distal corner; second segment very short, more than twice as wide as long, furnished with a few setae on outer and inner margins; third segment long, 1 and 1/4 times as long as wide, armed with a few plumose setae at inner distal corner (Fig. 11, b, c). Antennal peduncle somewhat longer than antennular peduncle in female and same length in male; basal joint very short, as long as wide; middle and distal joints equal in length (Fig. 11, b, c, d). Antennal scale moderate, reaching beyond distal border of antennular peduncle by about 1/3 of the length of scale, more than 3 times as long as broad; external margin nearly straight, terminating into a strong spine; terminal lobe of scale with apex narrowly rounded, about 1/5 of total length of scale, as long as broad at base of lobe, twice as long as terminal spine of naked external margin (Fig. 11, e). Mouth parts and first thoracic endopod exhibit no salient points of difference from those of other species of the genus (Fig. 12, a, b, c, d). Second thoracic endopod rather robust; carpus as long as propodus, dactylus comparatively long, 2/5 of length of propodus (Fig. 12, e). Abdomen 6-jointed, first to fifth somites subequal; sixth

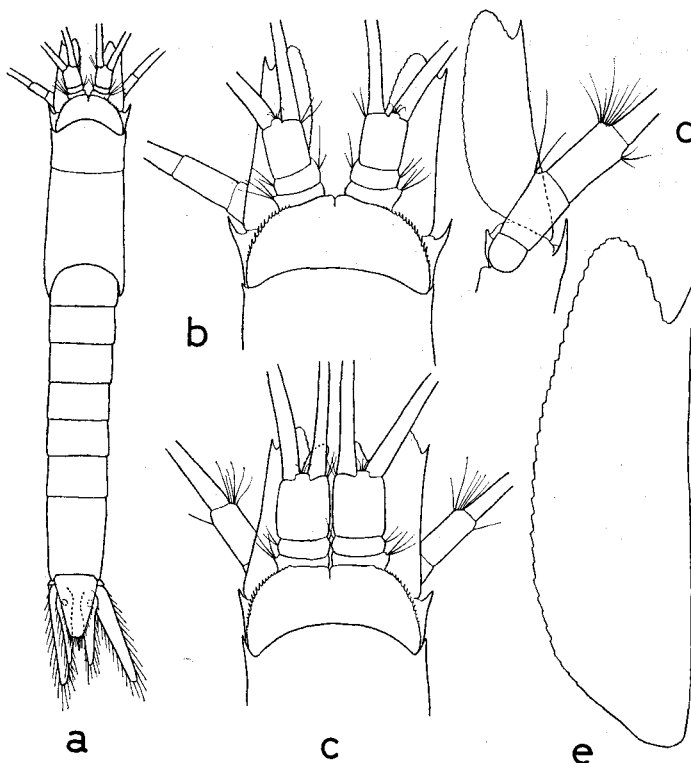


Fig. 11. *Pseudomma lamellicaudum* sp. nov., a, adult female in dorsal view,  $\times 6$ ; b, anterior end of adult female,  $\times 17$ ; c, anterior end of immature male,  $\times 17$ ; d, antenna peduncle and scale,  $\times 20$ ; e, antenna scale,  $\times 42$ .

somite longest, twice as long as fifth (Fig. 11, a). Pleopods in present immature male 8- or 9-jointed except endopod of first pair which is uniarticulated (Fig. 12, f, g). Telson linguiform, somewhat shorter than last abdominal somite, 1.5 times as long as broad; lateral margin unarmed on its basal 2/5, armed on its distal 3/5 with about 14 short spines which are arranged spatially and are irregular in length, apical 3 pairs of spines long and stout, becoming progressively longer from outer pair to inner pair; innermost pair of spines less than 1/4 of length of telson; a pair of apical plumose setae present (Fig. 12, h). Uropod slender; exopod twice as long as telson; endopod extending beyond apex of telson by its 1/3, armed with a single, short, weak spine on ventral side near inner margin at statocyst region (Fig. 12, i).

#### Types :

Holotype, adult female of 11.2 mm; allotype, immature male of 9.6 mm; and 11 paratypes; all from St. 533.

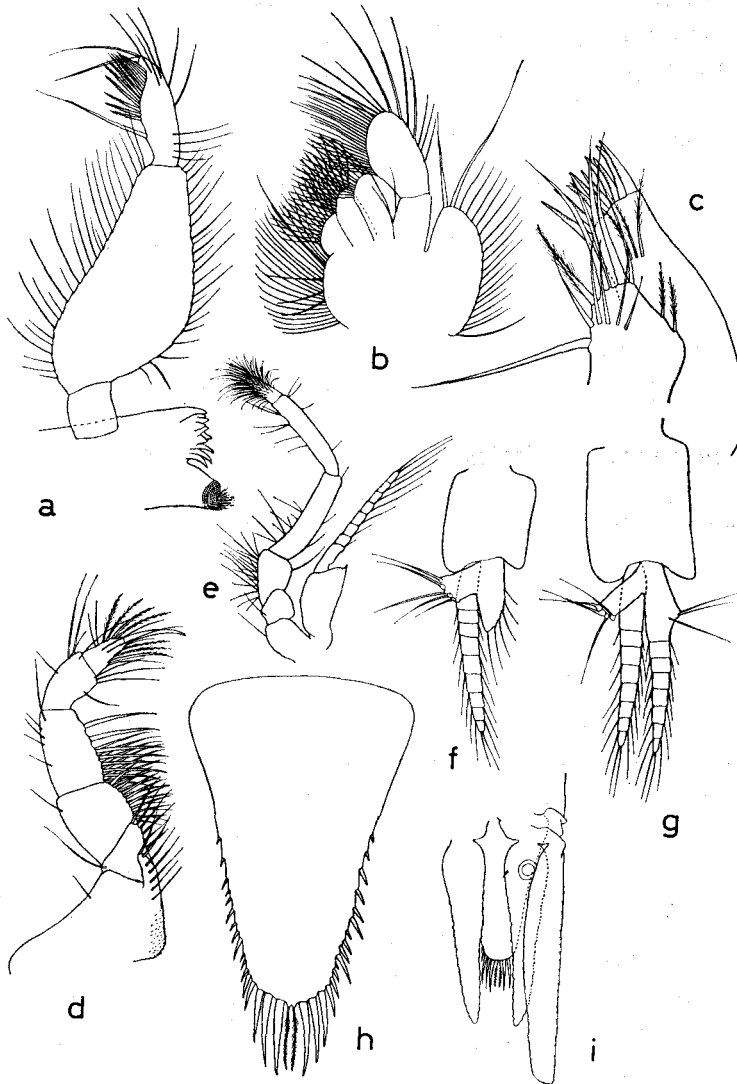


Fig. 12. *Pseudomma lamellicaudum* sp. nov., a, mandible,  $\times 39$ ; b, maxilla,  $\times 39$ ; c, maxillule,  $\times 78$ ; d, endopod of first thoracic limb,  $\times 39$ ; e, second thoracic limb,  $\times 16$ ; f, first pleopod of immature male,  $\times 34$ ; g, fourth pleopod of immature male,  $\times 34$ ; h, telson,  $\times 34$ ; i, telson and uropod,  $\times 16$ .

Remarks :

The most important characteristics in this species is that the lateral margin of the telson are furnished somewhat densely with more than 10 spines. Among the genus *Pseudomma* only a few species have such characteristics. Out of these, *P. multispina* Birstein and Tchindonova collected from the adjacent sea of Japan is the most related

to the present species. However, there is a difference between the two species in the arrangement of spines on the telson. In the present species apical 3 pairs of spines are arranged to become progressively longer from outer pair to inner pair, while in *P. multispina* distal 5 pairs of spines are progressively longer from inner pair to outer. The former is also distinguishable from the latter by the scale. In the latter the scale is more than 4 times as long as broad and its terminal lobe is as long as the spine of the outer margin.

The present species is also allied to an Antarctic species, *P. longicaudum* O. Tattersall, but is easily distinguished by the scale and telson.

*P. lamellicaudum* sp. nov. is chiefly distinguished from other species of the genus by the shape and armature of the telson.

The name *lamellicaudum* refers to the shape of the distal margin of telson.

*Pseudomma multispina* BIRSTEIN and TCHINDONOVA 1958.

(Fig. 13)

*Pseudomma multispina* Birstein and Tchindonova, 1958: 327-328.

Occurrence : St. Tl, 1 adult male in bad condition (12.4 mm)

Remarks :

Convincible identification of the present specimen is impossible because the spines arming on the distal margin of telson are perfectly broken off. However, the specimen is identified with *P. multispina*, though with some doubts, from the resemblance in some

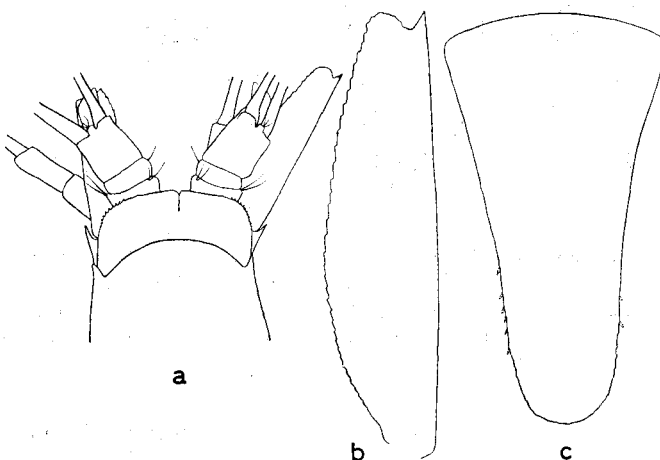


Fig. 13. *Pseudomma multispina* Birstein and Tchindonova, a, anterior end of adult male,  $\times 11$ ; b, antennal scale,  $\times 28$ ; c, telson,  $\times 28$ .

respects as follows: (1) Eyeplate has 13 denticles at each of antero-lateral corners. (2) Antennal scale is about 4 times as long as broad and its apex is extending to the same level with the terminal spinous process of external margin of scale. (3) Length of telson is about twice as long as broad, and it is supposed that the telson has originally over 10 spines on its lateral margin.

In addition to the external characters the identity of the locality and collection depth of the both forms may be useful to the present identification.

The present specimen, however, differs from the type specimen in the following points; (1) Anterior margin of eyeplate is nearly straight. (2) External margin of scale is slightly convex. (3) Lateral spines of the telson are restricted in its distal 1/3. (4) Distal margin of telson is more rounded.

*Pseudomma calloplura* HOLT and W. TATTERSALL 1905.

*Pseudomma calloplura* Holt and W. Tattersall, 1905: 126 and 145; 1906: 30-33; W. Tattersall, 1909: 133; Zimmer, 1909: 106-107; W. Tattersall, 1911: 46; Bacesco, 1941: 19-21; W. Tattersall and O. Tattersall, 1951: 236-238; Murano, 1970: 142.

Occurrence : St. 221-5, 2 adult males in bad condition (ca. 7.1 mm).  
St. 293-2, 2 adult males (8.0, 8.1 mm).  
St. 293-3, 1 adult male in bad condition.  
St. 533, 1 adult female (7.2 mm) and 1 adult male (7.5 mm).

*Pseudomma latipthalmum* sp. nov.

(Figs. 14, 15, 16)

Occurrence : St. 533, 2 adult females (6.7, 7.2 mm).  
St. 574, 4 adult (6.0-6.4 mm) and 3 immature females, 2 adult (ca. 6.0 mm) and 1 immature males.  
St. 557-1, 88 adult (5.8-6.9 mm) and 22 immature females, 21 adult (5.2-5.7 mm) and 37 immature males.

Description :

Body compact (Fig. 14, a). Carapace rather short, not extending a little to anterior end of abdomen in lateral view, leaving last thoracic somite uncovered in dorsal view; anterior margin broadly arched without projected rostrum; cervical sulcus well marked (Fig. 14, a, b). Eyeplate very wide, equal to anterior portion of carapace in width, covering basal half of first segment of antennular peduncle; antero-lateral corner of margin evenly rounded, furnished with about 23 teeth; median anterior cleft clear but shallow (Fig. 14, b). Antennular peduncle short and robust, first segment armed with

a few setae at distal outer corner; second segment very short, armed with a prominent seta on inner margin; third segment longer than either of the other two, of length larger than breadth (Fig. 14, b). Antennal peduncle slender, about  $2/3$  of length of scale, extending beyond distal border of antennular peduncle by its distal half of third segment; first segment short, as long as broad; second and third segment equal in length (Fig. 14, b, c). Antennal scale rather short, less than 3.5 times as long as broad, extending beyond anterior margin of antennular peduncle by its distal  $1/3$ ; external margin nearly straight or slightly concave, ending into a strong spine which does not extend to apex of scale; terminal lobe short, less than  $1/10$  of length of scale (Fig. 14, c). Mouth parts and first thoracic endopod allied to those of other species of the genus (Fig. 14, d, e, f, g). Second thoracic endopod somewhat slender; carpus long, nearly equal in length to following 2 segments combined (Fig. 14, h). Abdomen 6-jointed; first 5 joints subequal; sixth joint long, twice as long as preceding one, 1

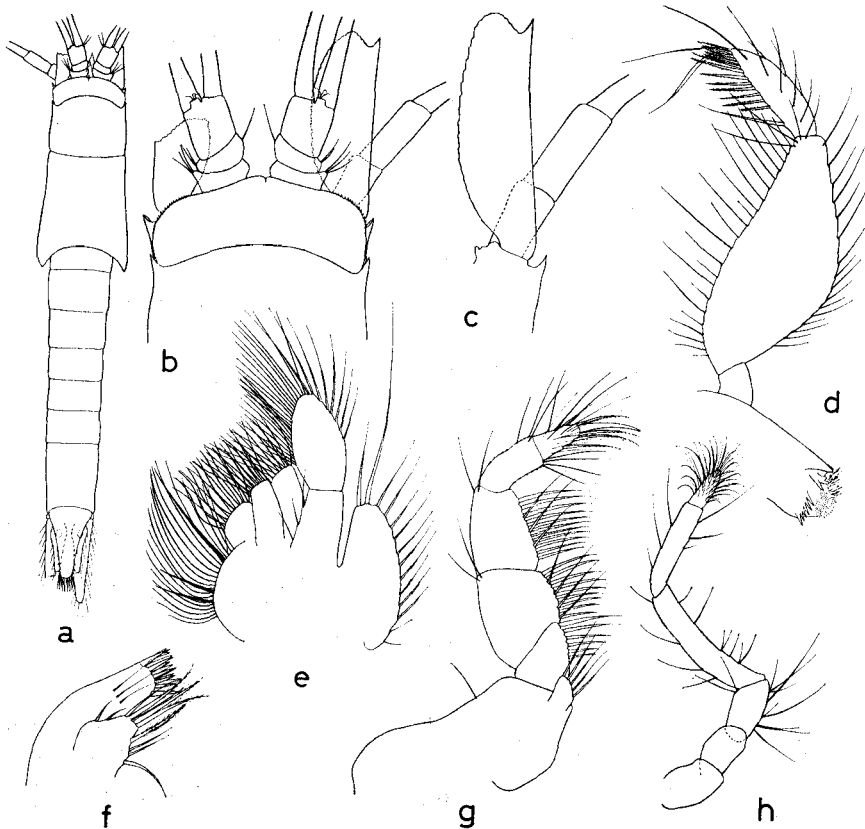


Fig. 14. *Pseudomma latiphthalmum* sp. nov., a, adult female in dorsal view,  $\times 10$ ; b, anterior end of adult female,  $\times 27$ ; c, antennal peduncle and telson,  $\times 34$ ; d, mandible,  $\times 67$ ; e, maxilla,  $\times 67$ ; f, maxillule,  $\times 67$ ; g, endopod of first thoracic limb,  $\times 67$ ; h, endopod of second thoracic limb,  $\times 34$ .

and  $1/3$  times as long as broad (Fig. 14, a). Telson elongate-linguiform, a little longer than last abdominal somite, slightly less than twice as long as broad at base; apex arcuate, armed with 4 pairs of long and slender spines, of which median pair is about  $1/5$  of length of telson; a pair of plumose setae present between median spines; lateral margin concave, furnished with 5 or 6 short spines on distal  $1/3$  to  $2/5$  of margin (Fig. 15, b). Exopod of uropod not so long, reaching beyond apex of telson by only  $1/5$  of exopod. Endopod of uropod armed on inner margin at region of statocyst with a single, short, feeble spine (Fig. 15, c).

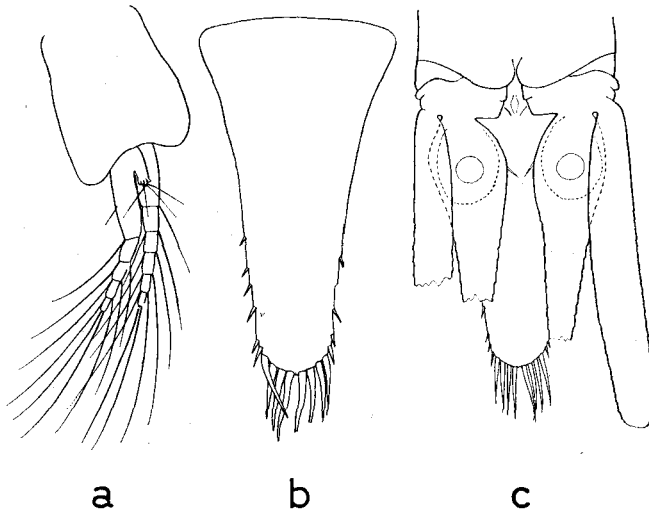


Fig. 15. *Pseudomma latiphthalmum* sp. nov., a, fourth pleopod of male,  $\times 42$ ; b, telson,  $\times 42$ ; c, posterior end of body in ventral view,  $\times 33$ .

#### Types :

Holotype, adult female of 7.2 mm from St. 533; allotype, immature male of 5.7 mm from St. 574; and paratypes, 1 adult female of 6.7 mm from St. 533.

#### Remarks :

The present new species resembles *P. berkeleyi* W. Tattersall captured from western Canada in the general form of the scale and telson. The former, however, differs from the latter in the eyeplate. In the present species it is armed with about 23 fine teeth on the antero-lateral margin, while in *P. berkeleyi* it is armed with only 9 coarse teeth. In the characteristics of the eyeplate the present species agrees with *P. schollaertensis* O. Tattersall from the Antarctic, but it differs from the latter in the length of scale and the shape and armature of telson.

From other species within the genus it is easily distinguishable by the combination of the wide eyeplate, scale with short terminal lobe and relatively long telson.



Out of the present collection the specimens collected in St. 557-1 differ from the type specimens in the following points. (1) Apex of antennal scale is extending to a short distance beyond external spine (Fig. 16, b). (2) Distal margin of telson is furnished with 3 pairs of long spines (Fig. 16, c). (3) Lateral margin of telson is furnished with 6 to 7 short spines on each side, of which 1 or 2 spines are arming on basal half of lateral margin (Fig. 16, c). (4) Body length of adult female is 5.8-6.9 mm.

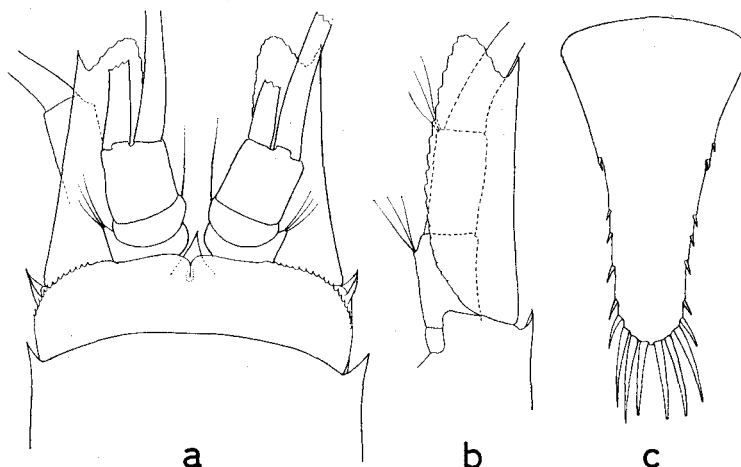


Fig. 16, *Pseudomma latiphthalmum* sp. nov., from St. 557-1 a, anterior end of adult female,  $\times 42$ ; b, antennal peduncle and telson,  $\times 47$ ; c, telson,  $\times 47$ .

In the treatment of 2 forms which were collected from Suruga Bay, I was for some time undecided whether they should belong the same species or be independent of each other. St. 557-1 where a form being different from the type specimens is collected is located near the type locality, St. 533, but in the depth there is a considerable difference in these two stations, 280 m in St. 557-1 and 570-660 m in St. 533. It must be sure that variations in the scale and telson mentioned above are produced by the difference in the depth of habitats. Although the differences in the telson and scale between 2 forms are not so small, I dealt with it under the same species after due consideration of close resemblance of general form.

The name *latiphthalmum* refers to the relatively wide eyeplate.

*Pseudomma crassidentatum* sp. nov.

(Figs. 17, 18)

Occurrence : St. 575, 13 adult (10.9-11.8 mm, of these 3 specimens with 15, 21 and 23 embryos) and 12 immature females, 2 adult (10.7, 11.7 mm) and 1 immature males.

## Description :

Anterior margin of carapace evenly rounded, no trace of any projected rostrum; posterior margin deeply emarginate, leaving last thoracic somite uncovered; cervical sulcus well marked (Fig. 17, a, b, c). Eyeplate long, reaching to distal margin of first segment of antennular peduncle; antero-lateral corner broadly rounded, furnished with about 14 coarse teeth (Fig. 17, b, c). Antennular peduncle more robust in male than in female; basal segment covered with eyeplate, with projected outer distal corner armed with a few setae; middle segment, short more than twice as wide as long; distal segment longer than other 2 segments together, about 1.5 times as long as broad; male appendage from distal segment large and very hirsute (Fig. 17, b, c). Antennal peduncle slender, as long as antennular peduncle; first segment short, of length less than breadth; second segment slightly longer and wider than third segment (Fig. 17, d). Antennal scale moderate, extending beyond antennular peduncle by about 1/3 of

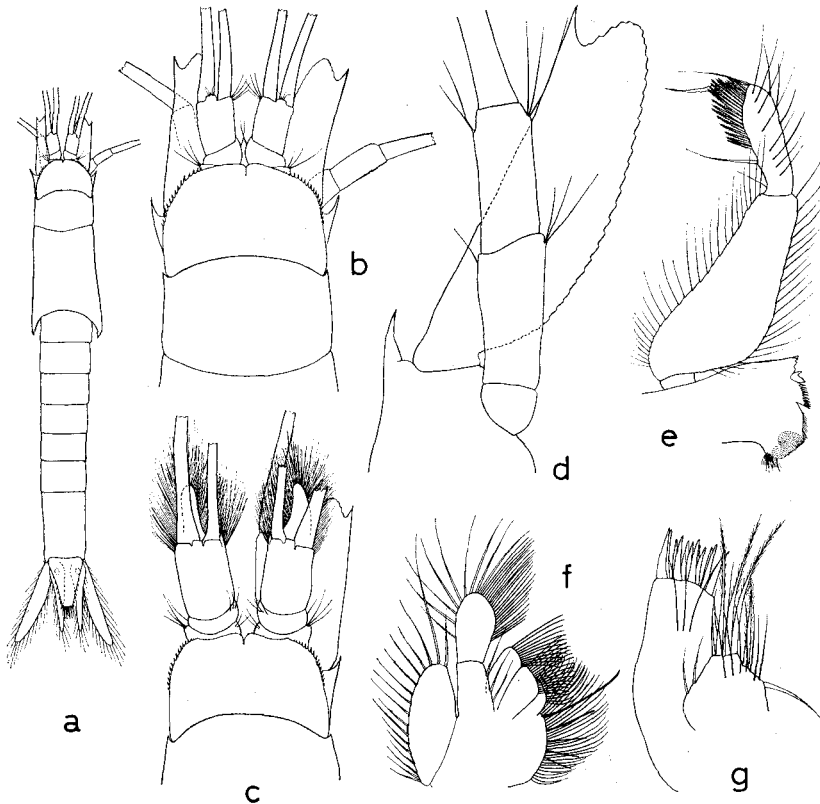


Fig. 17. *Pseudomma crassidentatum* sp. nov., a, adult female in dorsal view,  $\times 5$ ; b, anterior end of adult female,  $\times 14$ ; c, anterior end of adult male,  $\times 14$ ; d, antennal peduncle and scale,  $\times 34$ ; e, mandible,  $\times 34$ ; f, maxilla,  $\times 34$ ; g, maxillule,  $\times 67$ .

its length, about 3.5 times as long as broad; apex of scale very slightly extending beyond spinous process which terminates naked external margin (Fig. 17, d). Mouth parts and first thoracic endopod in common to those of congeners in the genus (Fig. 17, e, f, g; Fig. 18, a). Second thoracic endopod somewhat slender, carpus long, nearly equal to length of propodus and dactylus combined (Fig. 18, b). First 5 abdominal

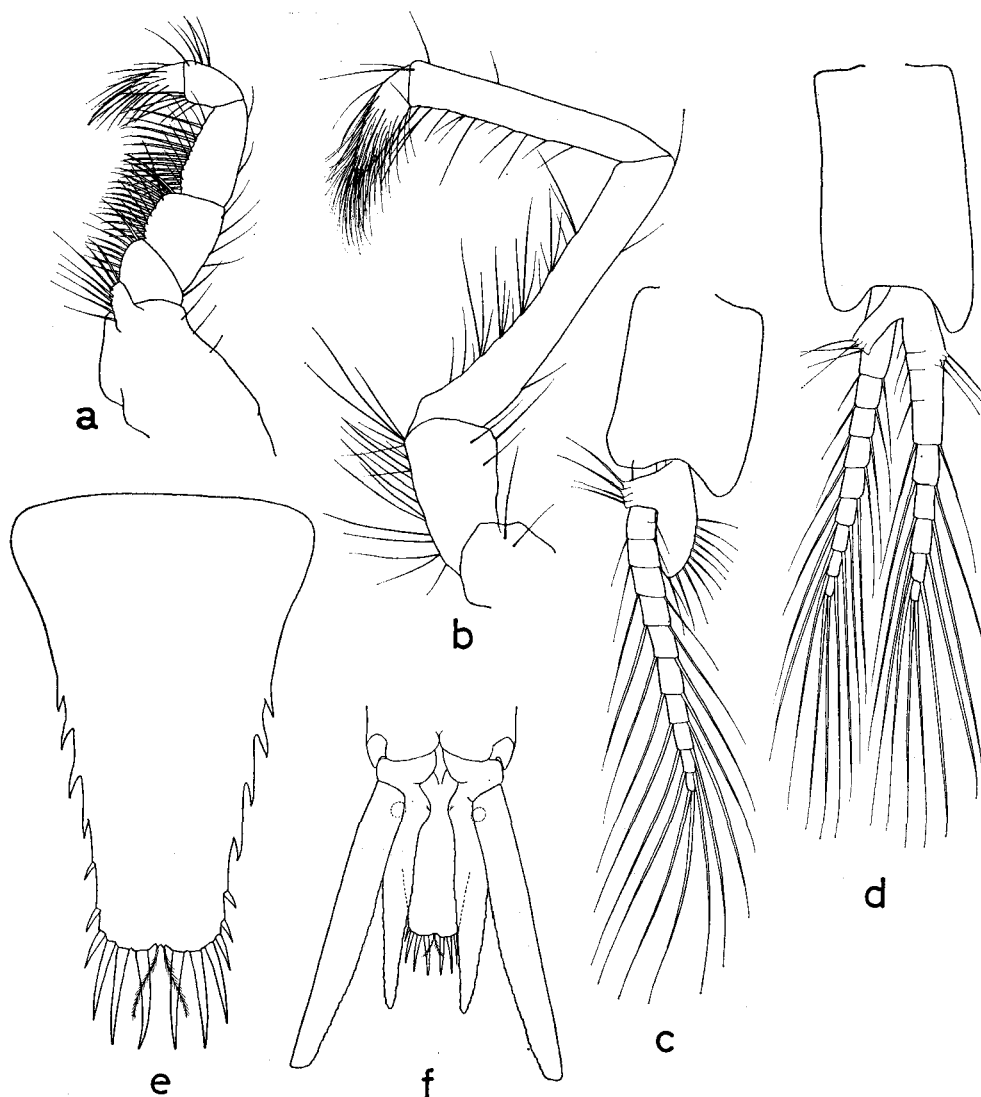


Fig. 18. *Pseudomma crassidentatum* sp. nov., a, endopod of first thoracic limb,  $\times 42$ ; b, endopod of second thoracic limb,  $\times 42$ ; c, first pleopod of male,  $\times 33$ ; d, fourth pleopod of male,  $\times 33$ ; e, telson,  $\times 42$ ; f, posterior end of body,  $\times 17$ .

segments subequal; sixth segment long, about 1.5 times as long as broad, more than twice as long as preceding one (Fig. 17, a). Pleopods of male developed and natatory, 9- or 10-segmented except endopod of first pair unsegmented (Fig. 18, c, d). Telson trapezium, much shorter than last abdominal somite, 1.5 times as long as broad at its base; distal margin rather wide, about  $2/5$  of width at base; furnished with 3 pairs of long stout spines, of which inner 2 pairs are almost same length, longer than outermost ones by  $1/4$  of its length, and  $1/5$  of total length of telson; lateral margin armed with about 7 short spines; a pair of apical plumose setae present (Fig. 18, e). Uropod slender; exopod reaching beyond distal margin of telson by its distal half; endopod reaching beyond distal margin of telson by its distal  $1/3$ , armed with a single feeble spine on ventral side near inner margin at statocyst region (Fig. 18, f).

Types :

Holotype, female with 15 embryos in marsupium, 11.6 mm; allotype, adult male of 11.7 mm; and paratypes, the other 13 adult specimens.

Remarks :

The present species most closely resembles *P. berkeleyi* W. Tattersall from the west of Vancouver, west coast of Canada, in the eyeplate with coarse serrulation on antero-lateral margin and in the scale with short terminal lobe which is almost the same length as the terminal spine of the outer margin, but it is distinguishable from the latter in the shape and armature of the telson. From the other species of the genus it is distinguished by the eyeplate extending to the distal margin of the first segment of the antennular peduncle, by the eyeplate with about 14 coarse teeth, by the scale with the terminal spine which is barely extending to the apex of scale, and by the trapezoid telson with 3 pairs of spines on distal margin and about 7 short spines on lateral margin.

The specific name *crassidentatum* is derived from the armature of eyeplate.

*Pseudomma sarsi* G. O. Sars 1884

(Fig. 19)

*Pseudomma sarsi* G. O. Sars, 1884: 37; 1885: 189-191; Hansen, 1913: 13; 1921: 2-3; Rustad, 1930: 7-8; O. Tattersall, 1955: 93-94.

Occurrence : St. 575, 2 adult (10.8, 11.5 mm, of these larger one with 14 embryos) and 1 immature (ca. 7 mm) females.

Remarks :

The present specimens were identified with *P. sarsi* from the Antarctic by the resemblance in the external characters. There are minute differences in the eyeplate and telson, but these are included within variations which have been confirmed by the

specimens from the Antarctic waters by O. Tattersall (1955). It is very interesting matter that the present specimens were collected from the waters where is separated a great distance from the type locality. However, the water temperature at the collection depth of the present specimens is 3 to 4°C and is contained in waters ranging in temperature of *P. sarsi* in the Antarctic from over 6 down to -0.8°C (O. Tattersall, 1955).

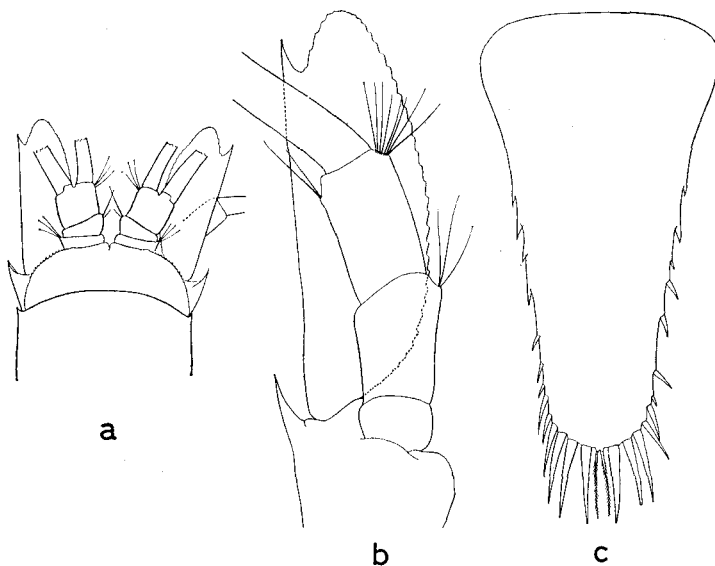


Fig. 19. *Pseudomma sarsi* G. O. Sars, a, anterior end in adult female,  $\times 14$ ; b, antennal peduncle and scale,  $\times 34$ ; c, telson,  $\times 34$ .

*Pseudomma okiyamai* sp. nov.

(Figs. 20, 21, 22)

- Occurrence : TR. 1, 3 adult males (14.2, 15.5 mm).  
 TR. 2, 1 adult female and 1 adult male.  
 TR. 3, 5 adult females (13.7-15.5 mm).  
 TR. 5, 1 immature female (7.2 mm).  
 TR. 7, 1 immature female.  
 TR. 8, 1 adult (15.3 mm) and 1 immature males.  
 TR. 9, 1 immature female (13.6 mm).  
 TR. 10, 1 adult female (13.3 mm).  
 TR. 12, 1 immature female (14.3 mm).

Description :

General form sublinear in shape (Fig. 20, a). Carapace broadly rounded anteriorly,

without any kind of projected rostrum; antero-lateral angles not produced in dorsal view; posterior margin emarginate posteriorly, leaving last thoracic somite uncovered (Fig. 20, a, b, c). Eyeplate considerably narrower than width of anterior portion of carapace, extending to halfway of first segment of antennular peduncle, with shallow median cleft, armed on antero-lateral corner with about 10 denticles; in female each half of plate with a small but distinct projection on its anterior margin at centre between median cleft and inner end of serrulation; in male this projection much more developed than in female, making a form like a pair of breasts (Fig. 20, b, c). Antennular peduncle thick and stout in male but not so much in female; first segment, widest, armed with a few setae on produced outer distal corner; second segment short, 2.5 to 3 times as wide as long, furnished with 2 plumose setae on inner margin, one of these is long and thick, extending to distal border of antennular peduncle; third segment longest, longer than preceding 2 segment combined, 1.5 times as long as broad; male appendage from third segment of antennular peduncle large, about  $\frac{2}{3}$  of its segment in length (Fig. 20, b, c). Antennal peduncle slender, extending beyond

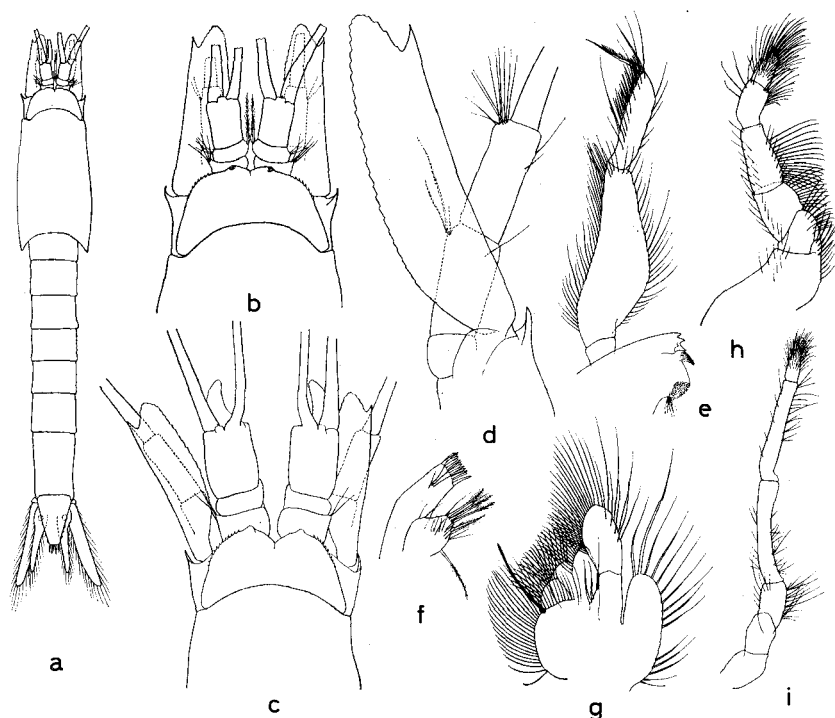


Fig. 20. *Pseudomma okiyamai* sp. nov., a, adult female in dorsal view,  $\times 4$ ; b, anterior end of adult female,  $\times 11$ ; c, anterior end of adult male,  $\times 11$ ; d, antennal peduncle,  $\times 22$ ; e, mandible,  $\times 22$ ; f, maxillule,  $\times 28$ ; g, maxilla,  $\times 28$ ; h, endopod of first thoracic limb,  $\times 22$ ; i, endopod of second thoracic limb  $\times 11$ .

antennular peduncle by  $1/4$  of length of its third segment in female and extending forward only slightly beyond antennular peduncle in male; first segment short, as long as broad; second segment twice as long as broad; third segment slightly longer than preceding one, 2.5 times as long as broad (Fig. 20, d). Antennal scale long and narrow, about 4 times as long as broad, twice as long as antennular peduncle in female and extending beyond antennular peduncle by  $1/4$  to  $1/5$  of length of scale in male; external margin slightly concave, naked, ending into a large spinous process; apex of scale narrowly rounded, extending beyond tip of terminal spinous process of naked outer margin by length of this process; terminal lobe occupies  $1/7$  to  $1/8$  of total length of scale (Fig. 20, d). Mouth parts and first thoracic endopod allied to those of

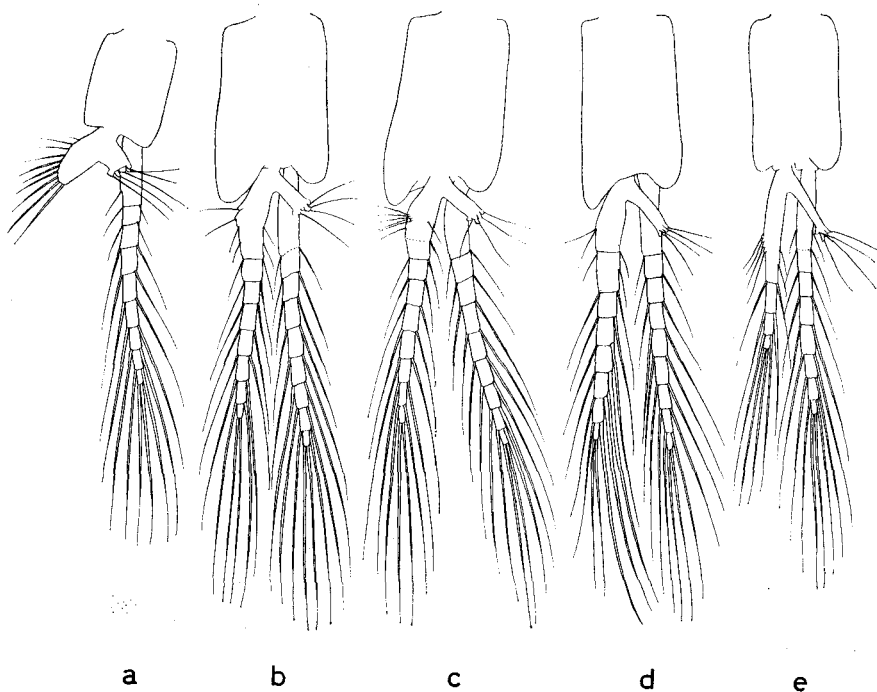


Fig. 21. *Pseudomma okiyamai* sp. nov., pleopods of male,  $\times 27$ ; a, first leg; b, second leg; c, third leg; d, fourth leg; e, fifth leg.

congeners of the genus (Fig. 20, e, f, g, h). Second thoracic endopod slender, with carpus and propodus almost equal in length (Fig. 20, i). First to fifth abdominal somites subequal; sixth abdominal somite long, 1.5 times as long as fifth, 1.5 times as long as broad (Fig. 20, a). Male pleopods well developed, biramous and natatory; first pair with unsegmented endopod and 9-segmented exopod; all the rami of second to fifth pairs 9- or thereabouts segmented, except endopod of fifth pair divided into only 4; exopods of pleopods longer than endopods, particularly in fifth pair it is so noticeable that exopod is lengthened beyond endopod by length of its distal 3 segments com-

bined; endopod of fourth pleopod armed on distal 3 segments except ultimate one furnished with relatively long and thick plumose setae; pseudobranchial process from basal segment of endopod become to be slender regularly towards posterior pairs (Fig. 21, a, b, c, d, e). In telson there are some variations in shape and armature. Telson trapezium, shorter than last abdominal somite, 1 and  $\frac{1}{3}$  to 1 and  $\frac{2}{3}$  times as long as broad at base; distal margin  $\frac{1}{3}$  to  $\frac{2}{9}$  of maximum width at base, furnished with 2 pairs of long spines, of which an inner pair are longer than the other, about  $\frac{1}{6}$  of length of telson; a pair of median plumose setae present on distal margin; lateral margin nearly straight, furnished with 3 to 6 small spines, of which terminal one is present at a short distance from posterior corner in many specimens, but in lesser specimens it is present close to corner (Fig. 22, b, c). Uropod slender; exopod twice as long as telson; endopod has intermediate length between telson and exopod, armed with a single, very feeble spine on inner margin at statocyst region (Fig. 22, a).

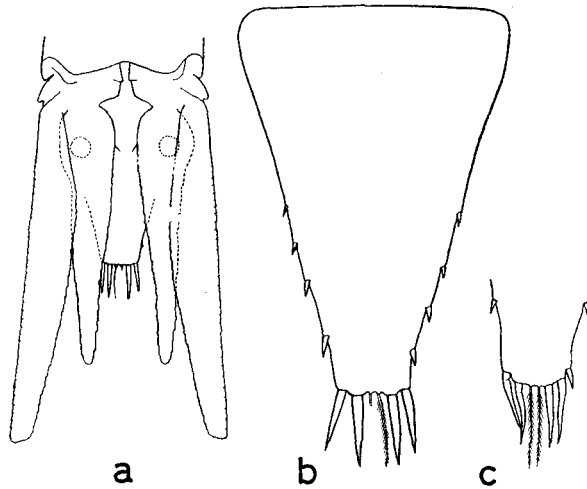


Fig. 22. *Pseudomma okiyamai* sp. nov., a, posterior end of body in ventral view,  $\times 17$ ; b, telson,  $\times 33$ ; c, distal end of telson,  $\times 33$ .

#### Types :

Holotype, adult female of 14.1 mm from TR. 3; allotype, adult male of 15.3 mm from TR. 8; and 4 paratypes from TR. 3.

#### Remarks :

The present species was found from the stomach contents of bottom fishes such as *Malacocottus gibber*, *Petroschmidtia toyamaensis*, *Hippoglossoides dubius* and *Liparis* sp. caught by trawl net carried out at depths of 365 to 1035 m in the central region of the Japan Sea.



In the specimens of the present species, there are some variations in the telson as if they were different species each other. It seems, however, that they can be identified with the same species because these variations in the telson are continuous in many specimens observed and the variations in the eyeplate and antennal scale are hardly found out.

It may be remarkable that exopods of second to fifth pleopods of male are longer than endopods. Such a matter has never been known in the other species of the genus, except in the one case of *P. magellanensis* O. Tattersall.

The present species is most closely related to *P. izuensis* Murano from the Pacific coast of Japan and *P. truncatum* Smith from the circumpolar waters of the Arctic. It is, however, different from the both latter species in the eyeplate with a small but distinct projection on its anterior margin in female and in the antennal scale which is 4 times as long as broad. In addition to these matters, from *P. izuensis* it is distinguished in the armature on the distal margin of telson, and from *P. truncatum* in the proportion between the lengths of scale and its terminal lobe, and in the arrangement of lateral spines of the telson.

The present species is distinguishable from the other species of the genus by the combination of the characteristics in the eyeplate, scale and telson.

The species is named for Mr. Muneo Okiyama, Japan Sea Regional Fisheries Research Laboratory, who offered to me the specimens for the identification.

*Pseudomma tanseii* sp. nov.

(Figs. 23, 24)

Occurrence : St. 533, 5 adult females (6.6-7.6 mm), 1 adult (6.6 mm) and 1 immature (5.4 mm) males.

Description :

Body compact (Fig. 23, a). Carapace with anterior margin very broadly rounded without rostral projection; posterior margin extending to articulation between thorax and abdomen on lateral side, but leaving almost last thoracic somite uncovered for its emargination on dorsal side (Fig. 23, a, b, c). Eyeplate reaching to halfway of basal joint of antennular peduncle, narrower than anterior portion of carapace, furnished with about 20 fine teeth on antero-lateral margin (Fig. 23, b, c). Antennular peduncle more robust in male than in female; basal joint armed with a few setae at projected outer distal corner; middle joint short, armed with a prominent seta on inner margin and with a few setae on outer margin; distal joint long, as long as preceding 2 joints combined and somewhat longer than width in female; much longer than preceding 2 joints combined, more than 1.5 times as long as broad in male (Fig. 23, b, c). Antennal peduncle slender, especially in male, reaching beyond the distal border of

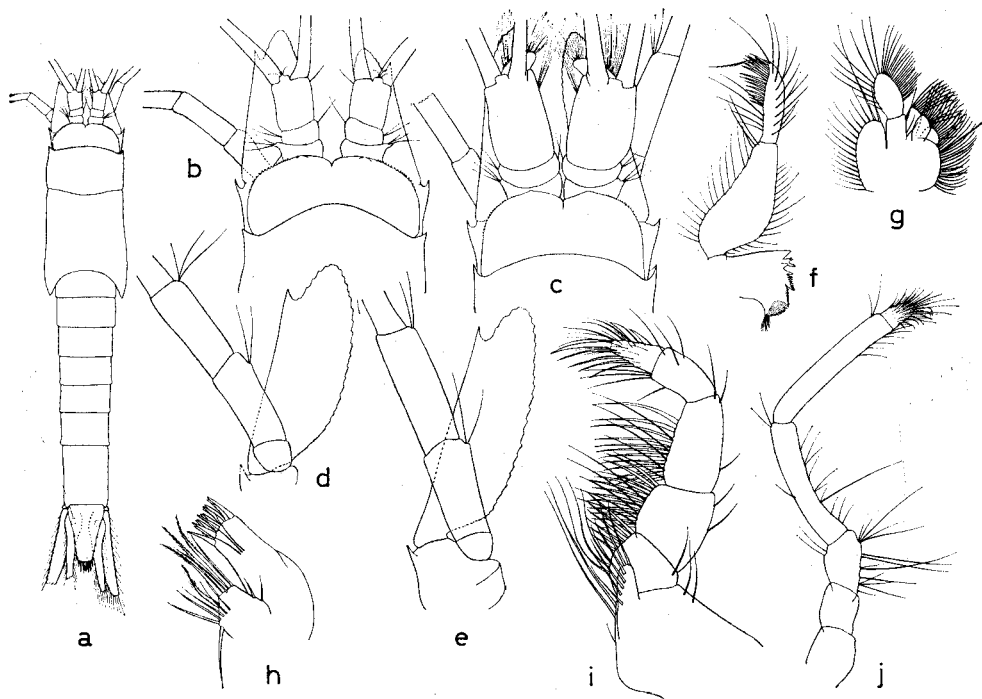


Fig. 23. *Pseudomma tanseii* sp. nov., a, adult female in dorsal view,  $\times 8$ ; b, anterior end of adult female,  $\times 22$ ; c, anterior end of adult male,  $\times 22$ ; d, antennal peduncle and scale of female,  $\times 28$ ; e, antennal peduncle and scale of male,  $\times 28$ ; f, mandible,  $\times 31$ ; g, maxilla,  $\times 28$ ; h, maxillule,  $\times 55$ ; i, endopod of first thoracic limb,  $\times 55$ ; j, endopod of second thoracic limb,  $\times 28$ .

antennular peduncle by distal 1/3 of its third joint; first joint as long as broad; second joint somewhat shorter than following one, equal to or more than twice as long as broad; third joint long and slender, 2.5 times as long as broad in female and nearly 3 times in male (Fig. 23, d, e). Antennal scale in the female rather short, 3 times as long as broad, extending beyond antennular peduncle by its distal 1/3; in male somewhat slender than in female, 3.5 times as long as broad, extending beyond antennular peduncle by its distal quarter; external margin nearly straight, terminating into a stout spinous process; apex of scale rounded, much extending forwards beyond terminal spinous process of external margin; terminal lobe about 1/5 of length of scale, 4 times as long as external spine, about as long as broad (Fig. 23, d, e). Mouth parts and first thoracic endopod common with those of congeners of the genus (Fig. 23, f, g, h, i). Second thoracic endopod somewhat slender, with carpus clearly shorter than propodus; dactylus short, about 1/5 of length of propodus (Fig. 23, j). Five anterior abdominal somites subequal; last abdominal somite long, nearly equal to preceding 2 somites combined, 1.5 times as long as broad (Fig. 23, a). Male pleopod developed,

natatory and biramous, 5- or 6-segmented except endopod of first pair (Fig. 24, a, b). Telson rather truncate than linguiform, slightly shorter than last abdominal somite, 1.5 times as long as broad at base; posterior margin somewhat less than half of width at base, armed with 3 pairs of long stout spines, of which innermost pair  $1/5$  to  $1/6$  of length of telson; a pair of plumose setae present; lateral margin slightly curved inwards, armed with about 4 short spines on distal half of each side (Fig. 24, c, d). Exopod of uropod relatively short, longer than endopod by only about  $1/12$  of its length; endopod reaching beyond apex of telson by its distal  $1/3$ , furnished with a single feeble spine on inner margin at region of statocyst (Fig. 24, e).

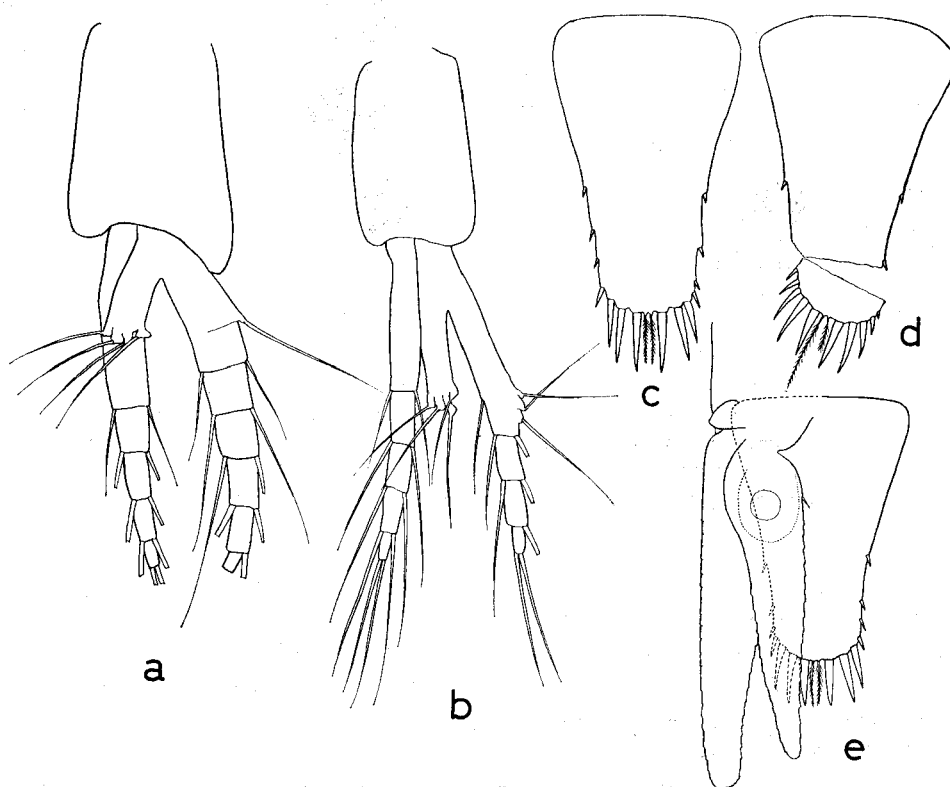


Fig. 24. *Pseudomma tanseii* sp. nov., a, fourth pleopod of male,  $\times 83$ ; b, fifth pleopod of male,  $\times 83$ ; c, telson of female,  $\times 42$ ; d, telson of male,  $\times 42$ ; e, telson and uropod,  $\times 33$ .

**Types :**

Holotype, adult female of 7.6 mm; allotype, adult male of 6.6 mm, and 5 paratypes.

**Remarks :**

The present new species resembles *P. izuensis* Murano, *P. sarsi* G. O. Sars, *P.*

*truncatum* Smith, *P. japonicum* Murano, *P. chattoni* Bacesco, *P. affine* G. O. Sars, *P. frigidum* Hansen and *P. roseum* G. O. Sars in the following 3 points: (1) Eyeplate is armed with fine denticles. (2) Terminal lobe of scale is much longer than the terminal spine of external margin. (3) Lateral margins are furnished with several short spines. In the comparison in detail with the 8 latter species, however, there are some small but specific differences as follows: (1) The present species differs from all the latter species in a characteristic that the length of terminal lobe of scale is about 1/5 of total length of scale. (2) In telson with rather truncate posterior margin than rounded it is distinguished from *P. japonicum*, *P. chattoni*, *P. affine*, *P. frigidum* and *P. roseum*. (3) From *P. izuensis*, *P. truncatum*, *P. affine*, *P. frigidum* and *P. roseum* the present species is distinguishable in having 3 pairs of long, subequal spines on distal margin of telson. (4) It is a unique character in this species that the propodus of second thoracic endopod is longer than the carpus.

It is remarkable matter that in the present species the sexual dimorphism is observed, but not so large, in the antennal peduncle and scale as noted above. It has already been observed in an English species, *P. nanum*, that there is a considerable large difference in the antennal peduncle between both sexes.

This species is named for the R/V Tansei-Maru.

*Pseudomma izuensis* MURANO 1966

(Fig. 25)

*Pseudomma izuensis* Murano, 1966a: 42-46.

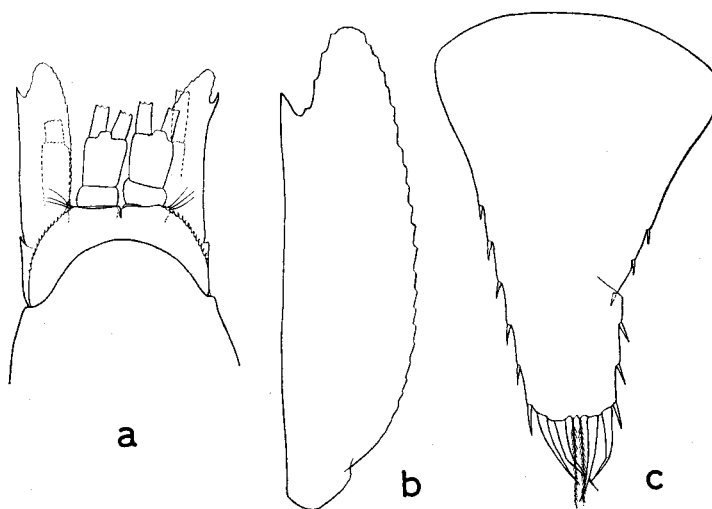


Fig. 25. *Pseudomma izuensis* Murano from TR. 3, a, anterior end of adult female,  $\times 17$ ; b, antennal scale,  $\times 42$ ; c, telson,  $\times 42$ .

Occurrence : St. 84-3, 9 adult (12-14 mm) and 6 immature females, 1 adult male (10.1 mm).

St. 104-2, 1 adult female (10.5 mm).

TR. 3, 1 adult female (10.8 mm).

Remarks :

A single female found in the stomach contents of *Liparis* sp. in the Japan Sea differs from the type specimen from Sagami Bay in the following points: (1) Anterior margin of eyeplate is produced forwardly at a small projection which is situated in anterior end of serrulation (Fig. 25, a). (2) Terminal lobe of scale is relatively long, occupying more than 1/6 of total length of scale (Fig. 25, b). (3) Distal margin of telson is somewhat narrow, being about 1/3 of maximum width at base (Fig. 25, c).

*Pseudomma japonicum* MURANO 1970

*Pseudomma japonicum* Murano, 1970a: 252-254; 1970b: 143.

Occurrence : St. S1, 7 females and 3 males.

St. S2, 32 females (up to 4.7 mm) and 5 males (up to 4.2 mm).

St. S3, 4 females.

St. 221-5, 2 adult (up to 6.6 mm) and 4 immature females, 1 adult (6.0 mm) and 2 immature males.

St. 293-2, 6 adult (6.0-7.0 mm) and 2 immature females, 7 adult (5.8-6.3 mm) and 2 immature males.

St. 293-3, 1 adult (6.4 mm) and 1 immature females, 2 adult (5.8, 6.5 mm) and 2 immature males.

St. 325-4, 1 adult female (5.3 mm).

St. 340, 1 adult female (5.1 mm).

St. 391-1, 5 adult females (3.8-4.3 mm).

St. 392-1, 28 females (4.2-4.9 mm), 15 males (up to 3.9 mm) and 4 youngs.

St. 492, 1 adult female, 3 adult and 1 immature males.

St. H33, 1 adult female (5.2 mm), 1 adult (4.8 mm) and 1 immature males.

St. H36, 2 adult (4.4, 4.9 mm) and 3 immature females, 2 adult males (4.8, 5.0 mm).

St. H41, 1 adult female with embryos (4.2 mm) and 1 adult male (4.4 mm).

*Pseudomma* sp.

(Fig. 26)

Occurrence : St. 575, 1 adult male (6.1 mm).

## Remarks :

The armature on the distal margin of telson is apparently abnormal and is deformed in the present specimen. Definite identification could not be made for this species.

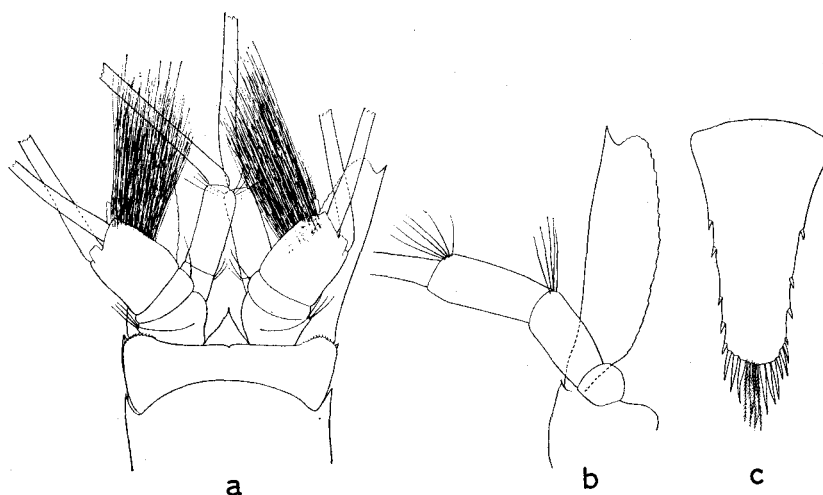


Fig. 26. *Pseudomma* sp., a, anterior end of adult male,  $\times 66$ ; b, antennal peduncle and scale,  $\times 34$ ; c, telson  $\times 34$ .

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Appendix-table 1. Tansei-Marui stations from which the collections reported here were taken.

Station No.	Date	Time(LMT)	Position	Sampling depth	Net and remarks
84-3	Oct. 25, 1964	16:34-17:45	From 35°06, 3'N, 139°17, 0'E to 35°04, 4'N, 139°17, 2'E	0-1000	ORI-net; accidentally touched the sea-floor
104-2	Mar. 1, 1965	11:39-12:55	From 35°05, 2'N, 139°17, 0'E to 35°02, 9'N, 139°16, 8'E	0-1300	ORI-net; accidentally touched the sea-floor
221-5	Apr. 23, 1967	13:30-14:16	Off Tateyama, Chiba Pref.	370-380	Bottom-net
293-2	Apr. 13, 1968	13:00-13:37	From 35°00, 3'N, 139°48, 4'E to 35°00, 0'N, 139°47, 6'E	220-330	Bottom-net
293-3	Apr. 13, 1968	14:05-14:43	From 35°00, 3'N, 139°47, 2'E to 35°00, 3'N, 139°47, 3'E	370-430	Bottom-net
325-4	Nov. 6, 1968	10:54-11:14	From 34°54, 1'N, 138°24, 4'E to 34°54, 0'N, 138°25, 1'E	45	Bottom-net
340	May 8, 1969	16:30-16:45	Off Tateyama, Chiba Pref.	75-110	Bottom-net
341	May 9, 1969	00:10-01:05	35°04, 4'N, 139°09, 9'E	360-460	Bottom-net
391-1	May 13, 1969	09:56-10:20	From 34°54, 3'N, 138°27, 8'E to 34°54, 2'N, 138°27, 1'E	42-66	Bottom-net
392-1	May 13, 1969	11:19-11:44	From 34°54, 0'N, 138°27, 0'E to 34°54, 1'N, 138°26, 3'E	72	Bottom-net
429	July 8, 1969	12:50-13:12	From 34°54, 2'N, 138°26, 6'E to 34°54, 0'N, 138°26, 8'E	35-55	Bottom-net
533	Jan. 24, 1971	12:27-12:50	From 34°45, 3'N, 138°22, 8'E to 34°44, 6'N, 138°22, 7'E	570-660	Bottom-net
557-1	Aug. 13, 1971	23:08-23:27	From 35°06, 2'N, 138°40, 0'E to 34°41, 5'N, 138°24, 7'E	280	ORI-net; accidentally touched the sea-floor
575	Aug. 15, 1971	17:54-18:10	From 34°52, 4'N, 138°36, 6'E to 34°52, 5'N, 138°37, 0'E	1020-1248	Bottom-net

Appendix-table 2. Hakuho-Marui stations from which the collections reported here were taken.

Station No.	Date	Time(LMT)	Position	Sampling depth	Net and remarks
H33	May 21, 1968	17:20-17:50	From 30°07, 8'N, 125°43, 2'E to 30°07, 5'N, 125°44, 0'E	76	Bottom-net
H35	May 21-22, 1968	23:45-00:10	From 29°26, 0'N, 126°27, 8'E to 29°25, 4'N, 126°27, 8'E	100	Bottom-net
H36	May 22, 1968	05:18-05:58	From 28°41, 0'N, 126°48, 2'E to 28°40, 2'N, 126°48, 9'E	185	Bottom-net
H41	May 24, 1968	09:02-09:35	From 28°01, 8'N, 125°01, 0'E to 28°02, 0'N, 125°01, 8'E	100	Bottom-net
T1	Dec. 3, 1967	10:15-11:30	36°19, 8'N, 141°40, 0'E	1690	Plankton net attached to the mouth of a beam trawl



Appendix-table 3. Suruga-MarU stations from which the collections reported here were taken.

Station No.	Date	Time(LMT)	Position	Sampling depth	Net and remarks
S1	July 14, 1967	07:50-08:20	From 34°55.6'N, 138°30.3'E to 34°55.4'N, 138°29.8'E	80	Plankton net attached to the mouth of a beam trawl
S2	July 14, 1967	13:15-13:45	From 34°44.1'N, 138°19.7'E to 34°44.5'N, 138°20.0'E	80	"
S3	July 14, 1967	15:20-15:50	From 34°49.2'N, 138°21.5'E to 34°49.8'N, 138°21.6'E	80	"

Appendix-table 4. Trawl stations where mysids fed by fishes were collected.

Station No.	Date	Position	Sampling depth	Feeders
TR. 1	June 5, 1970	40°02.5'N, 134°12.9'E	775	<i>Malacocottus gibber</i>
TR. 2	June 12, 1970	37°59.5'N, 133°48.5'E	505	<i>Malacocottus gibber</i>
TR. 3	June 10, 1970	39°01.8'N, 134°09.5'E	495	<i>Liparis</i> sp.
TR. 5	June 1, 1970	39°23.5'N, 135°32.5'E	760	<i>Petroschmidtia toyamaensis</i>
TR. 7	June 13, 1970	37°51.2'N, 133°32.0'E	795	<i>Malacocottus gibber</i>
TR. 8	June 2, 1970	39°29.3'N, 134°44.6'E	1035	<i>Malacocottus gibber</i>
TR. 9	June 14, 1970	37°04.2'N, 133°11.0'E	355	<i>Malacocottus gibber</i>
TR. 10	June 12, 1970	37°59.9'N, 133°48.5'E	505	<i>Petroschmidtia toyamaensis</i>
TR. 12	June 10, 1970	39°02.2'N, 134°14.9'E	365	<i>Hippoglossoides dubius</i>